

SLV-495/495PX/675HF/675HFPX/676HF/685HF/695HF/L40CS/L40MX/L40PA/L50CS/L50MX/  
L50PA/L60HFCS/L60HFMX/L60HFPA/L70HFCS/L70HFMX/L70HFPA/X5MX/X6HFMX  
RMT-V198C/V201A/V202A/V203/V203A/V203B

# SERVICE MANUAL



**H MECHANISM**

Photo : SLV-675HF

- Refer to the **SERVICE MANUAL** of VHS MECHANICAL ADJUSTMENTS IV for MECHANICAL ADJUSTMENTS. (9-973-623-11)

**US Model**

SLV-495/675HF/676HF/685HF/695HF

**Canadian Model**

SLV-495/675HF/695HF

**Mexican Model**

SLV-L40MX/L50MX/L60HFMX/  
L70HFMX/X5MX/X6HFMX

**Panamanian Model**

SLV-L40PA/L50PA/L60HFPA/L70HFPA

**Chilean Model**

SLV-L40CS/L50CS/L60HFCS/L70HFCS

**PX Model**

SLV-495PX/675HFPX

## SPECIFICATIONS

### System

Format  
VHS NTSC standard  
Video recording system  
Rotary head helical scanning FM system  
Video heads  
Double azimuth four heads  
Video signal  
NTSC color, EIA standards  
Tape speed  
SP: 33.35 mm/s (1 <sup>3</sup>/<sub>8</sub> inches/s)  
EP: 11.11 mm/s (7/16 inches/s)  
LP: 16.67 mm/s (11/16 inches/s),  
playback only  
Maximum recording/playback time  
8 hrs. in EP mode (with T-160 tape)  
Fast-forward and rewind time  
Approx. 3 min. (with T-120 tape)

### Tuner section

Channel coverage  
VHF 2 to 13  
UHF 14 to 69  
CATV A-8 to A-1, A to W, W+1 to W+84  
Antenna  
75-ohm antenna terminal for VHF/UHF

### Inputs and outputs

LINE IN  
VIDEO IN, phono jack  
Input signal: 1 Vp-p, 75 ohms, unbalanced,  
sync negative  
AUDIO IN, phono jack  
Input level: 327 mVrms  
Input impedance: more than 47 kilohms  
LINE OUT  
VIDEO OUT, phono jack  
Output signal: 1 Vp-p, 75 ohms, unbalanced,  
sync negative  
AUDIO OUT, phono jack  
Standard output: 327 mVrms  
Load impedance: 47 kilohms  
Output impedance: less than 10 kilohms

### Timer section

Clock  
Quartz locked  
Timer indication  
12-hour cycle  
Timer setting  
8 programs per month (max.)  
Power back-up  
Built-in self-charging capacitor  
Back-up duration: up to 1 hour at a time

### General

Power requirements  
See next page.  
Power consumption  
See next page.  
Operating temperature  
5°C to 40°C (41°F to 104°F)  
Storage temperature  
-20°C to 60°C (-4°F to 140°F)  
Dimensions  
Approx. 355 × 102 × 280 mm (w/h/d)  
(Approx. 14 × 4 <sup>1</sup>/<sub>8</sub> × 11 <sup>1</sup>/<sub>8</sub> inches) including  
projecting parts and controls  
Mass  
Approx. 4.0 kg (8 lb 13 oz)  
**Supplied accessories**  
Remote commander (1)  
Size AA (R6) batteries (2)  
75-ohm coaxial cable with F-type connectors (1)  
Audio/video cable (3 phono to 3 phono) (1) (HiFi model)  
Plug adaptor (1) (Chilean, PX models)

Design and specifications are subject to change  
without notice.

## VIDEO CASSETTE RECORDER

# SONY®



992162811

• DIFFERENT SPECIFICATIONS LIST

| SPECIFICATION \ MODEL       | SLV-495      | SLV-495PX           | SLV-675HF    | SLV-676HF | SLV-675HFPX         | SLV-685HF    | SLV-695HF |
|-----------------------------|--------------|---------------------|--------------|-----------|---------------------|--------------|-----------|
| AUDIO SYSTEM                | MONAURAL     |                     | HiFi-STEREO  |           |                     | HiFi-STEREO  |           |
| TUNER AUDIO (STEREO) SYSTEM | —            |                     | SAP          |           |                     | SAP          |           |
| VCR+ SYSTEM                 | BUILT-IN     |                     | —            |           |                     | BUILT-IN     |           |
| LINE 2 INPUT                | BUILT-IN     |                     | —            |           |                     | BUILT-IN     |           |
| BODY COLOR                  | BLACK        |                     | BLACK        | GRAY      | BLACK               | BLACK        |           |
| DUAL MODE SHUTTLE           | —            |                     | —            |           |                     | —            |           |
| POWER REQUIREMENTS          | 120V AC 60Hz | 110-240V AC 50/60Hz | 120V AC 60Hz |           | 110-240V AC 50/60Hz | 120V AC 60Hz |           |
| POWER CONSUMPTION           | 23W          |                     | 24W          |           |                     | 24W          |           |
| REMOTE COMMANDER            | RMT-V203A    |                     | RMT-V203     |           |                     | RMT-V203A    | RMT-V202A |

| SPECIFICATION \ MODEL       | SLV-L40CS           | SLV-L40MX    | SLV-L40PA | SLV-L50CS           | SLV-L50MX    | SLV-L50PA | SLV-X5MX |
|-----------------------------|---------------------|--------------|-----------|---------------------|--------------|-----------|----------|
| AUDIO SYSTEM                | MONAURAL            |              |           | MONAURAL            |              |           |          |
| TUNER AUDIO (STEREO) SYSTEM | —                   |              |           | —                   |              |           |          |
| VCR+ SYSTEM                 | —                   |              |           | —                   |              |           |          |
| LINE 2 INPUT                | —                   |              |           | BUILT-IN            |              |           |          |
| BODY COLOR                  | BLACK               |              |           | BLACK               |              |           | GRAY     |
| DUAL MODE SHUTTLE           | —                   |              |           | BUILT-IN            |              |           |          |
| POWER REQUIREMENTS          | 110-240V AC 50/60Hz | 120V AC 60Hz |           | 110-240V AC 50/60Hz | 120V AC 60Hz |           |          |
| POWER CONSUMPTION           | 18W                 |              |           | 18W                 |              |           |          |
| REMOTE COMMANDER            | RMT-V198C           |              |           | RMT-V201A           |              |           |          |

| MODEL<br>SPECIFICATION         | SLV-L60HFCS            | SLV-L60HFMX     | SLV-L60HFPA | SLV-X6HFMX | SLV-L70HFCS            | SLV-L70HFMX     | SLV-L70HFPA |
|--------------------------------|------------------------|-----------------|-------------|------------|------------------------|-----------------|-------------|
| AUDIO SYSTEM                   | HiFi-STEREO            |                 |             |            | HiFi-STEREO            |                 |             |
| TUNER AUDIO<br>(STEREO) SYSTEM | SAP                    |                 |             |            | SAP                    |                 |             |
| VCR+ SYSTEM                    | —                      |                 |             |            | —                      |                 |             |
| LINE 2 INPUT                   | —                      |                 |             |            | BUILT-IN               |                 |             |
| BODY COLOR                     | BLACK                  |                 |             | GRAY       | BLACK                  |                 |             |
| DUAL MODE SHUTTLE              | —                      |                 |             |            | BUILT-IN               |                 |             |
| POWER REQUIREMENTS             | 110-240V AC<br>50/60Hz | 120V AC<br>60Hz |             |            | 110-240V AC<br>50/60Hz | 120V AC<br>60Hz |             |
| POWER CONSUMPTION              | 19W                    |                 |             |            | 19W                    |                 |             |
| REMOTE COMMANDER               | RMT-V203B              |                 |             |            | RMT-V201A              |                 |             |

**SAFETY-RELATED COMPONENT WARNING!!**

COMPONENTS IDENTIFIED BY MARK  $\triangle$  OR DOTTED LINE WITH MARK  $\triangle$  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

**ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!**

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE  $\triangle$  SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA TW-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate low voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

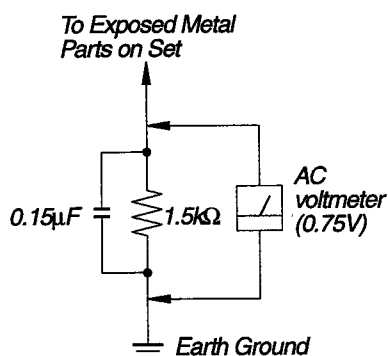


Fig. A. Using an AC voltmeter to check AC leakage.

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## SERVICE NOTE

### 1. HOW TO RETURN THE PINCH ROLLER, GUIDE ROLLER AND ELEVATOR CAM TO STOP MODE

- 1) Remove the VHS MD assembly from the machine. (Refer to section 2-4. Removal.)
- 2) Rotate the worm gear-1 of the cam motor beneath the MD assembly in the direction arrow **A** using a screw driver tip.

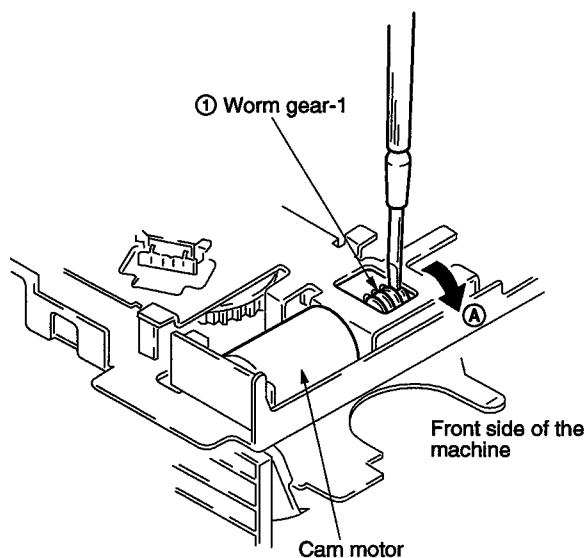


Fig. 1

### 2. HOW TO RETURN A TAPE INTO CASSETTE HALF

A tape can be rewound into a cassette half by rotating the flywheel-1 of the capstan motor in the direction of **A** with hand.

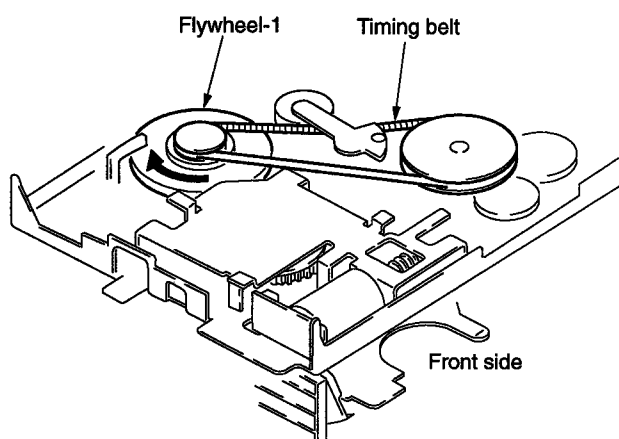


Fig. 2

### 3. HOW TO REMOVE A CASSETTE FROM A MACHINE IF A CASSETTE IS LEFT IN A MACHINE IN TROUBLE

Execute the section 2, and keep rotating the flywheel-1.

When executing section 1 to 3, take care that a tape slack should not be caught by a mechanism or a tape should not be damaged.

### 4. HOW TO REMOVE DRUM ASSEMBLY

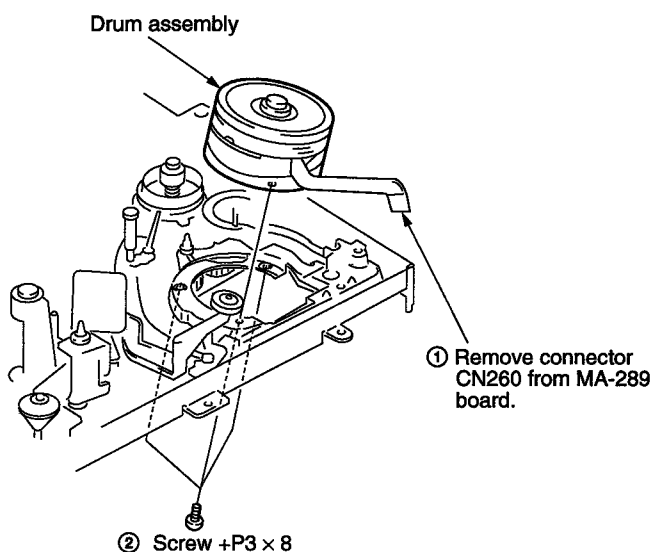


Illustration : SLV-675HF/676HF/675HFPX/685HF/695HF/  
L60HFCS/L60HFMX/L60HFPA/X6HFMX/L70HFCS/  
L70HFMX/L70HFPA

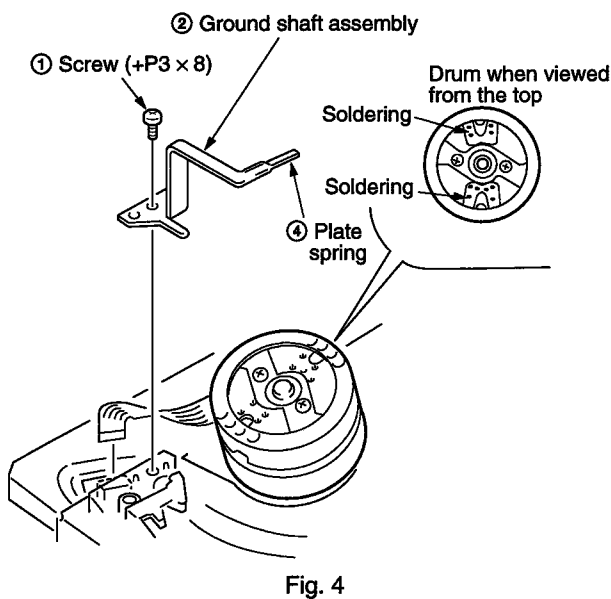
Fig. 3

## 5. HOW TO REPLACE A ROTARY UPPER DRUM UPPER DRUM (SLV-675HF/676HF/ 675HFPX/685HF/695HF/L60HFCS/ L60HFMX/L60HFPA/X6HFMX/ L70HFCS/L70HFMX/L70HFPA)

### 5-1. HOW TO REMOVE A ROTARY UPPER DRUM

- 1) Remove screw ① (+P3×8) and remove the ground shaft assembly ②. (Refer to Fig. 4.)
- 2) Remove soldering which is marked by arrow and remove the rotary upper drum board completely.
- 3) Remove two screws ③ (PSW3×8) and remove the rotary upper drum in the direction of A. (Refer to Fig. 5.)  
If removal is difficult, remove it while rotating it slowly.

**Note:** If removal is difficult, check again if soldering is removed completely.



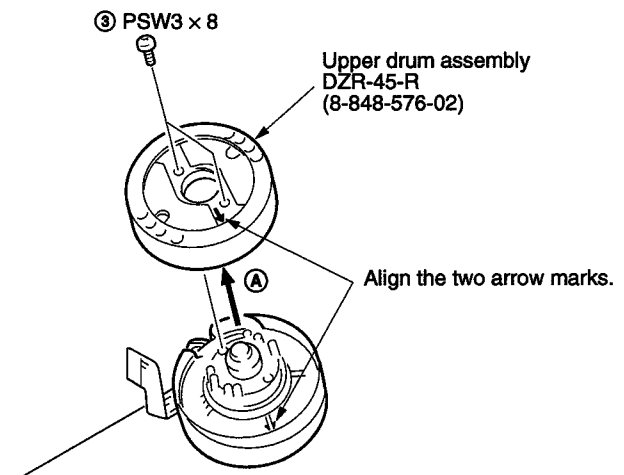
### 5-2. HOW TO ATTACH A NEW ROTARY UPPER DRUM

- 1) Pay attention so that finger print or like must not be put when inserting a new upper drum into lower drum.
- 2) Align ⇒ mark of the rotary upper drum board with the ⇒ mark of the rotary transformer board so that the screw hole on the upper drum and that on the lower drum are aligned. (Refer to Fig. 5.)
- 3) If attaching is difficult, attach a upper drum while rotating it slowly.

**Note:** Pay attention not to damage the video heads.  
Confirm that the upper drum is inserted completely.

- 4) Tighten the two screws ③ (PSW3×8). (Refer to Fig. 5.)
- 5) Fix the earth shaft ② by tightening the screw ① (+P3×8) so that protrusion at the tip of the earth shaft contacts the center of the drum shaft.

**Note:** When attaching the ground shaft assembly ②, never give force to the plate spring ④.



**SLV-495/495PX/675HF/675HFPX/676HF/685HF/695HF/L40CS/L40MX/L40PA/L50CS/L50MX/  
L50PA/L60HFCS/L60HFMX/L60HFPA/L70HFCS/L70HFMX/L70HFPA/X5MX/X6HFMX**

## SECTION 1 GENERAL

This section is extracted from the SLV-675HF/675HFPX/676HF instruction manual.

### Getting Started

#### Step 1

### Unpacking

Check that you have received the following items with the VCR

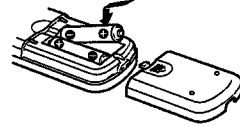
- Remote commander
  - 75-ohm coaxial cable with F-type connectors
  - Size AA (R6) batteries
  - Plug adaptor (SLV-675HF PX)
  - Audio/video cable (3-phono to 3-phono)
- If the plug supplied with your VCR does not fit your power outlet, attach the supplied adaptor to the plug

#### Step 2

### Setting up the remote commander

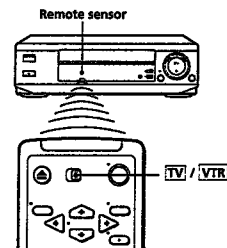
#### Inserting the batteries

Insert two size AA (R6) batteries by matching the + and - on the batteries to the diagram inside the battery compartment



#### Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV.



| To operate | Set <u>TV/VTR</u> to                                 |
|------------|------------------------------------------------------|
| the VCR    | <u>VTR</u> and point at the remote sensor on the VCR |
| a Sony TV  | <u>TV</u> and point at the remote sensor on the TV   |

#### Notes

- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage
- Do not use a new battery with an old one.
- Do not use different types of batteries

continued

4 Getting Started

Getting Started 5

### Step 2: Setting up the remote commander (continued)

#### Controlling other TVs with the remote commander

The remote commander is preprogrammed to control non-Sony TVs. If your TV is listed in the table below, set the appropriate manufacturer's code number.

- 1 Set TV/VTR at the top of the remote commander to TV.
- 2 Hold down POWER, and enter your TV's code number(s) using the number buttons. Then release POWER.

Now you can use the POWER, VOL +/-, CH +/- and TV/VTR buttons to control your TV. You can also use the buttons marked with a dot (•) to control a Sony TV. To control the VCR, reset TV/VTR to VTR.

#### Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

| Manufacturer     | Code number | Manufacturer   | Code number | Manufacturer | Code number |
|------------------|-------------|----------------|-------------|--------------|-------------|
| Sony             | 01          | JVC            | 09          | RCA          | 04,10       |
| Akai             | 04          | KMC            | 03          | Sampo        | 12          |
| AOC              | 04          | Magnavox       | 03,08,12    | Sanyo        | 11          |
| Centurion        | 12          | Marantz        | 04,13       | Scott        | 12          |
| Coronado         | 03          | MGA/Mitsubishi | 04,12,13,17 | Sears        | 07,10,11    |
| Curtis-Mathes    | 12          | NEC            | 04,12       | Sharp        | 03,05,18    |
| Daytron          | 12          | Panasonic      | 06,19       | Sylvania     | 08,12       |
| Emerson          | 03,04,14    | Philco         | 03,04       | Teknika      | 03,08,14    |
| Fisher           | 11          | Philips        | 08          | Toshiba      | 07          |
| General Electric | 06,10       | Pioneer        | 16          | Wards        | 03,04,12    |
| Gold Star        | 03,04,17    | Portland       | 03          | Yorx         | 12          |
| Hitachi          | 02,03       | Quasar         | 06,18       | Zenith       | 15          |
| J.C. Penny       | 04,12       | Radio Shack    | 05,14       |              |             |

#### Notes

- If the TV uses a different remote control system from the one programmed to work with the VCR, you cannot control your TV with the remote commander
- If you enter a new code number, the code number previously entered will be erased
- When you replace the batteries of the remote commander, the code number automatically resets to 01 (Sony). Reset the appropriate code number

#### Step 3

### Hookups

#### Selecting the best hookup option

There are many ways in which your VCR can be hooked up. To hook up your VCR so that it works best for you, first scan through the table below. Then use the accompanying diagrams and procedures on the following pages to set up your VCR.

| If you have                                                       | Use                                                             | Refer to        |
|-------------------------------------------------------------------|-----------------------------------------------------------------|-----------------|
| TV that has audio/video input                                     | Audio/video (A/V) hookup, then follow one of the hookups below. | Page 8          |
| Antenna only, no cable TV                                         | Hookup 1                                                        | Pages 9 and 10  |
| Cable box with many scrambled channels                            | Hookup 2                                                        | Pages 11 and 12 |
| No cable box or cable box with only a few scrambled channels      | Hookup 3                                                        | Pages 13 and 14 |
| Cable box with only a few scrambled channels, using an A/B switch | Hookup 4                                                        | Pages 15 and 16 |

After you've completed the connections, follow the instructions for setup. During setup, if you need more details on the procedure described, page numbers are provided where you can find complete, step-by-step instructions.

After you've completed the setup, you're ready to use your VCR. Procedures differ depending on the hookup you used. For an overview, refer to "Quick reference to using the VCR" on the back cover.

#### Before you get started

- Turn off the power to all equipment.
- Do not connect the AC power cords until all of the connections are completed.
- Be sure you make connections firmly. Loose connections may cause picture distortion.
- If your TV doesn't match any of the examples provided, see your nearest Sony dealer or qualified technician.

#### Caution

Connections between the VCR's VHF/UHF connector and the antenna terminals of the TV receiver should be made only as shown in the following instructions. Failure to do so may result in operation that violates the regulations of the Federal Communications Commission regarding the use and operation of RF devices. Never connect the output of the VCR to an antenna or make simultaneous (parallel) antenna and VCR connections at the antenna terminals of your receiver.

Getting Started

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### Step 3: Hookups (continued)

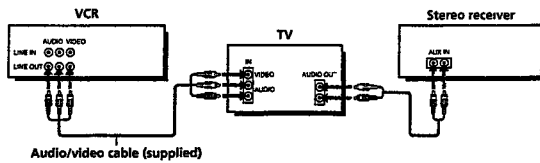
#### Audio/video (A/V) hookup

Page 8

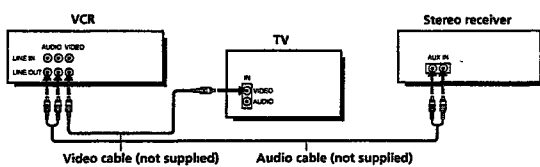
If your TV has audio/video (A/V) input jacks, you will get a better picture and sound if you hook up your VCR using these connections. In addition, for a true "home theater" experience, you should connect the audio outputs of your VCR or TV to your stereo system. If your TV doesn't have A/V inputs, see the following pages for antenna or cable hookups.

If you're not planning to use your VCR to record programs, you're finished setting up the VCR after you've made the connections shown on this page. If you want to record off-air or off your cable TV system, complete these connections first, and then go to the following pages for antenna or cable hookups.

**A** Use this hookup if your TV has stereo jacks



**B** Use this hookup if your TV doesn't have stereo jacks



#### Note

To play a tape in stereo, you must use the A/V connection.

#### Note to CATV system installer (in USA)

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

8 Getting Started

#### Hookup 1

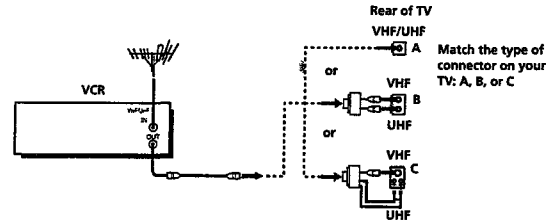
Pages 9 and 10

#### Antenna hookup

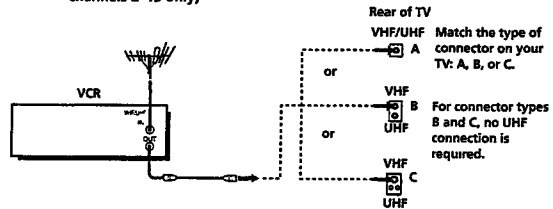
Make the following connections if you're using an antenna (if you don't have cable TV).

**A** Use this hookup if you're using:

- VHF/UHF antenna (you get channels 2-13 and channels 14 and higher)
- UHF-only antenna (you get channels 14 and higher)
- Separate VHF and UHF antennas



**B** Use this hookup if you're using a VHF-only antenna (you get channels 2-13 only)



#### If you cannot connect your antenna cable to the VCR directly

If your antenna cable is a flat cable (300-ohm twin lead cable), attach an external antenna connector (not supplied) so you can connect the cable to the VHF/UHF IN connector. If you have separate cables for VHF and UHF antennas, you should use a U/V band mixer (not supplied). For details, see page 41.

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### Step 3: Hookups (continued)

#### Hookup 1: VCR setup

- 1 Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.

For details, see page 40. If you made A/V connections (page 8), you can skip this step.

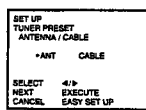
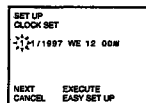
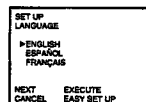
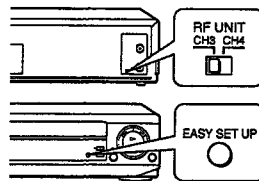
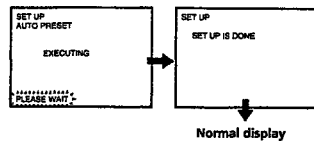
- 2 Press EASY SET UP on the VCR.

- 1 The LANGUAGE menu appears. Change the on-screen display language to Spanish (ESPAÑOL) or French (FRANÇAIS) if desired, and press EXECUTE. For details, see page 17.

- 2 The CLOCK SET menu appears. Set the clock and press EXECUTE. For details, see page 18.

- 3 The TUNER PRESET menu appears. Set ANTENNA/CABLE to ANT and press EXECUTE. For details, see page 19.

- 4 The AUTO PRESET starts.



#### Hookup 2

Pages 11 and 12

#### Cable box with many scrambled channels

##### Recommended use

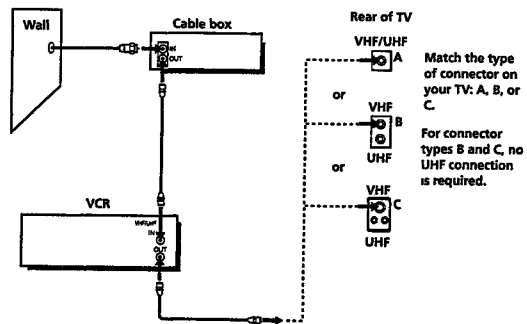
Use this hookup if your cable system scrambles all or most channels.

##### What you can do with this hookup

- Record any channel by selecting the channel on the cable box.

##### What you can't do

- Record one channel while watching another channel.



continued

Getting Started

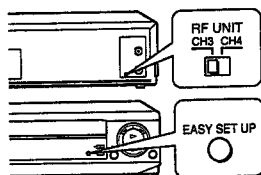
10 Getting Started

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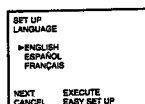
### Step 3: Hookups (continued)

#### Hookup 2: VCR setup

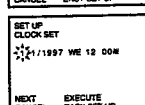
- 1 Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.  
For details, see page 40. If you made A/V connections (page 8), you can skip this step.
- 2 Turn on your cable box.
- 3 Press EASY SET UP on the VCR.



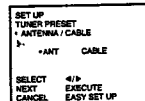
- 1 The LANGUAGE menu appears. Change the on-screen display language to Spanish (ESPAÑOL) or French (FRANÇAIS) if desired, and press EXECUTE. For details, see page 17.



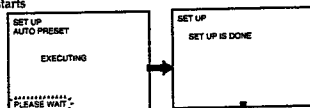
- 2 The CLOCK SET menu appears. Set the clock and press EXECUTE. For details, see page 18.



- 3 The TUNER PRESET menu appears. Set ANTENNA/CABLE to ANT and press EXECUTE. For details, see page 19.



- 4 The AUTO PRESET starts.



Normal display

#### Hookup 3

Pages 13 and 14

#### No cable box, or cable box with only a few scrambled channels

##### Recommended use

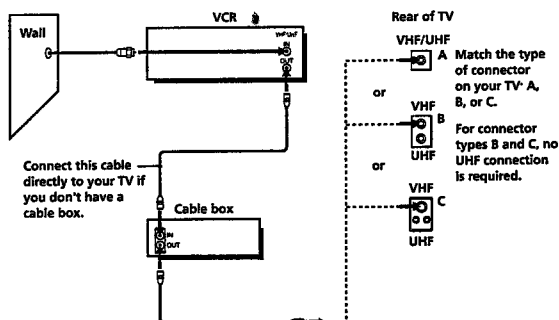
Use this hookup if you do not have a cable box. Also use this hookup if your cable system scrambles only a few channels.

##### What you can do with this hookup

- Record any unscrambled channel by selecting the channel on the VCR.

##### What you can't do

- Record scrambled channels that require a cable box.

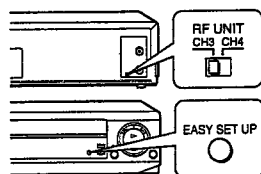


continued

### Step 3: Hookups (continued)

#### Hookup 3: VCR setup

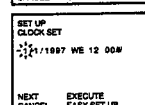
- 1 Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.  
For details, see page 40. If you made A/V connections (page 8), you can skip this step.
- 2 Turn on your cable box.
- 3 Press EASY SET UP on the VCR.



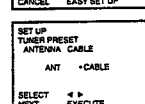
- 1 The LANGUAGE menu appears. Change the on-screen display language to Spanish (ESPAÑOL) or French (FRANÇAIS) if desired, and press EXECUTE. For details, see page 17.



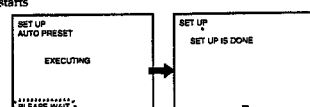
- 2 The CLOCK SET menu appears. Set the clock and press EXECUTE. For details, see page 18.



- 3 The TUNER PRESET menu appears. Set ANTENNA/CABLE to CABLE and press EXECUTE. For details, see page 19.



- 4 The AUTO PRESET starts.



Normal display

#### Hookup 4

Pages 15 and 16

#### Cable box with only a few scrambled channels, using an A/B switch

##### Recommended use

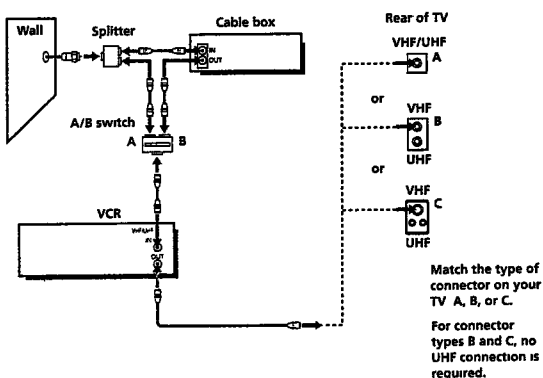
By using an A/B switch (not supplied), this hookup allows you to record both scrambled and unscrambled channels conveniently.

##### What you can do with this hookup

- Record any unscrambled channel by selecting the channel directly on the VCR (the A/B switch is set to A).
- Record any scrambled channel by selecting the channel on the cable box (the A/B switch is set to B).

##### What you can't do

- Record one scrambled channel while watching another channel (the A/B switch is set to B).

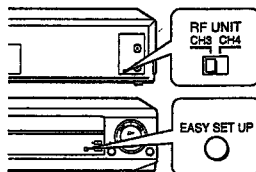


continued

### Step 3: Hookups (continued)

#### Hookup 4: VCR setup

- 1 Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.  
For details, see page 40. If you made A/V connections (page 8), you can skip this step.
- 2 Set the A/B switch to "A".
- 3 Press EASY SET UP on the VCR.

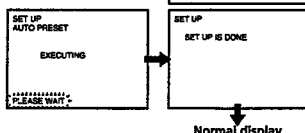


- 1 The LANGUAGE menu appears. Change the on-screen display language to Spanish (ESPAÑOL) or French (FRANÇAIS) if desired, and press EXECUTE. For details, see page 17.

- 2 The CLOCK SET menu appears. Set the clock and press EXECUTE. For details, see page 18.

- 3 The TUNER PRESET menu appears. Set ANTENNA/CABLE to CABLE and press EXECUTE. For details, see page 19.

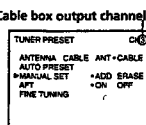
- 4 The AUTO PRESET starts.



Normal display

- 4 Preset the cable box output channel (usually 2, 3 or 4). For details, see page 21.

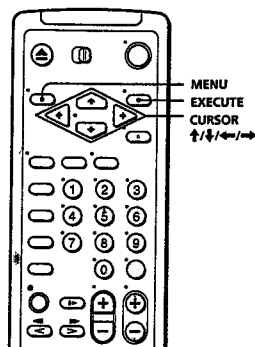
- 1 Press MENU and select TUNER PRESET.
- 2 Enter the cable box output channel.
- 3 Set MANUAL SET to ADD and press EXECUTE.



16 Getting Started

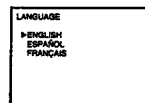
### Selecting a language

You can change the on-screen display language.



Getting Started

- 1 Press MENU, then press CURSOR  $\uparrow/\downarrow$  to move the cursor ( $\rightarrow$ ) to LANGUAGE and press EXECUTE.  
When using the EASY SET UP procedure, skip this step.



- 2 Press CURSOR  $\uparrow/\downarrow$  to select ENGLISH, ESPAÑOL, or FRANÇAIS, then press EXECUTE.

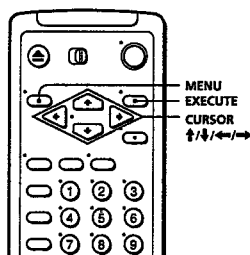
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### Setting the clock

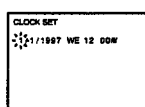
Set the time and date to use the timer feature for recording programs.

#### Before you start...

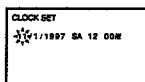
- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VTR to display the VTR indicator in the VCR's display window.



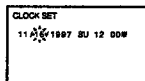
- 1 Press MENU, then press CURSOR  $\uparrow/\downarrow$  to move the cursor ( $\rightarrow$ ) to CLOCK SET and press EXECUTE.  
When using the EASY SET UP procedure, skip this step.



- 2 Press CURSOR  $\uparrow/\downarrow$  to set the month.



- 3 Press CURSOR  $\rightarrow$  to flash the day and press CURSOR  $\uparrow/\downarrow$  to set the day. The day of the week is set automatically.



- 4 Set the year, hour and minutes in the same way as the day.

- 5 Press EXECUTE to start the clock.

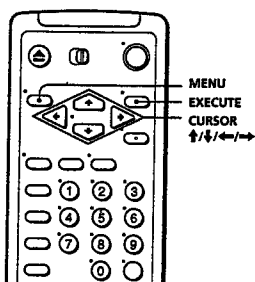
18 Getting Started

### Presetting channels

This VCR is capable of receiving VHF channels 2 to 13, UHF channels 14 to 69 and unscrambled CATV channels 1 to 125. First, we recommend that you preset the receivable channels in your area using automatic presetting. Then, if there are any unwanted channels, disable them manually. If you have decided which channels you wish to preset, set them directly using manual presetting.

#### Before you start...

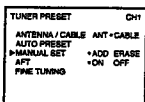
- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VTR to display the VTR indicator in the VCR's display window.



Getting Started

#### Presetting all receivable channels automatically

- 1 Press MENU, then press CURSOR  $\uparrow/\downarrow$  to move the cursor ( $\rightarrow$ ) to TUNER PRESET and press EXECUTE.  
When using the EASY SET UP procedure, skip this step.



- 2 Press CURSOR  $\uparrow/\downarrow$  to select ANTENNA/CABLE.

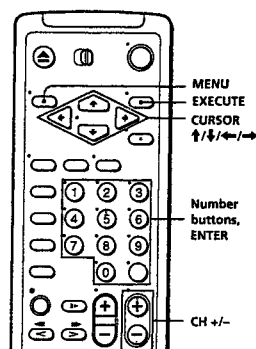
continued

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## Presetting channels (continued)

- 3**
- To preset cable TV channels  
Press CURSOR  $\leftarrow/\rightarrow$  to set ANTENNA/CABLE to CABLE
  - To preset VHF and UHF channels  
Press CURSOR  $\leftarrow/\rightarrow$  to set ANTENNA/CABLE to ANT
- 4**
- Press CURSOR  $\uparrow/\downarrow$  to select AUTO PRESET, then press EXECUTE
- All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen

## Presetting/disabling channels manually

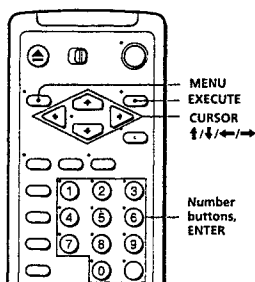


- 1**
- Press MENU and select TUNER PRESET, then press EXECUTE
- 2**
- To preset a channel  
1 Press the number buttons to enter the channel number, then press ENTER  
2 Press CURSOR  $\leftarrow/\rightarrow$  to set MANUAL SET to ADD
  - To disable a channel  
1 Press CH +/- to select the channel number  
2 Press CURSOR  $\leftarrow/\rightarrow$  to set MANUAL SET to ERASE
- 3**
- Repeat step 2 to preset or disable channels as required, then press EXECUTE

## Presetting channels (continued)

### If the picture is not clear

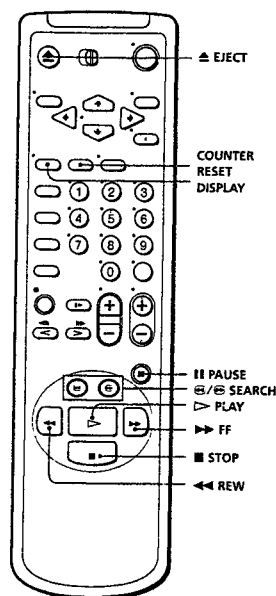
Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture of a channel is not clear, you can also use the manual tuning function



- 1**
- Press MENU and select TUNER PRESET, then press EXECUTE
- 2**
- Press the number buttons to select the channel you want to fine-tune, then press ENTER
- 3**
- Press CURSOR  $\uparrow/\downarrow$  to select FINE TUNING  
The fine tuning meter appears
- 4**
- Press CURSOR  $\leftarrow/\rightarrow$  to adjust to a clearer picture, then press EXECUTE  
Note that the AFT setting switches to OFF

## Basic Operations

### Playing a tape



- 1**
- Turn on your TV and set it to the video channel
- 2**
- Insert a tape  
The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed

## Playing the tape (continued)

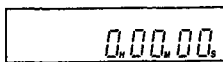
- 3**  Press **▶ PLAY**  
When the tape reaches the end, it will rewind automatically

### Additional tasks

| To                      | Press                                            |
|-------------------------|--------------------------------------------------|
| Stop play               | <b>■ STOP</b>                                    |
| Pause play              | <b>⏸ PAUSE</b>                                   |
| Resume play after pause | <b>⏸ PAUSE</b> or <b>▶ PLAY</b>                  |
| Search forward          | <b>▶▶ FF</b> or <b>⏏ SEARCH</b> during playback  |
| Search backward         | <b>◀◀ REW</b> or <b>⏏ SEARCH</b> during playback |
| Fast-forward the tape   | <b>▶▶ FF</b> during stop                         |
| Rewind the tape         | <b>◀◀ REW</b> during stop                        |
| Eject the tape          | <b>⏏ EJECT</b>                                   |

### To use the time counter

At the point on the tape that you want to find later, press **COUNTER RESET**. The counter in the display window resets to "00:00:00". Search for the point afterwards by referring to the counter.

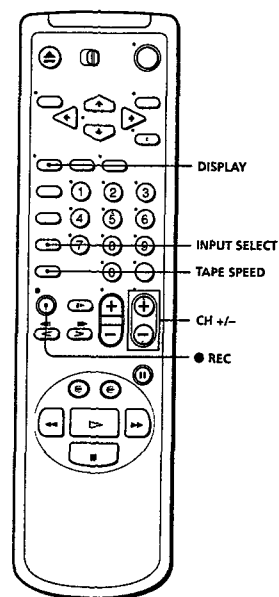


To display the counter on the TV screen, press **DISPLAY**.

### Notes

- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The counter resets to "00:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.

## Recording TV programs



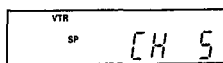
Basic Operations

- 1 Turn on your TV and set it to the video channel.  
To record from a cable box, turn it on.
- 2 Insert a tape with its safety tab in place.

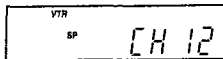
continued

## Recording TV programs (continued)

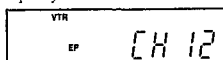
- 3**  Press **INPUT SELECT** until a channel number appears in the display window.



- 4**  Press **CH +/-** to select the channel you want to record.



- 5**  Press **TAPE SPEED** to select the tape speed, SP or EP. EP provides recording time three times as long as SP; however, SP produces better picture and audio quality.



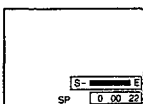
- 6**  Press **● REC** to start recording.

### To stop recording

Press **■ STOP**.

### To check the remaining tape length

Press **DISPLAY**. The white bar indicates the approximate length of tape remaining. The remaining time indicator also appears in the display window.



To check the remaining time of a T-140, T-180 or longer tape, set **TAPE SELECT** in the **ADVANCED OPTIONS** menu to "180". (For details, see page 37.)

### To watch another TV program while recording

- 1 Press **TV/VTR** to turn off the VTR indicator in the display window.
- 2 If the TV is connected to the VCR's **LINE OUT** jacks, set the TV to TV input; if not, skip this step.
- 3 Select another channel on the TV.

### To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.



Safety tab

### Tips

- To select a channel, you can use the number buttons on the remote commander. Enter the channel number, then press **ENTER**.
- You can select a video source from the **LINE IN** jacks using **INPUT SELECT**.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV. When using a cable box, make sure to leave it on.

### Notes

- The remaining tape length may not be indicated accurately for short tapes such as T-20 or T-30, or tapes recorded in the LP mode.
- The display doesn't appear during still (pause) mode, search mode or slow-motion playback.
- It may take up to one minute for the VCR to calculate and display the remaining tape length after you press **DISPLAY**.

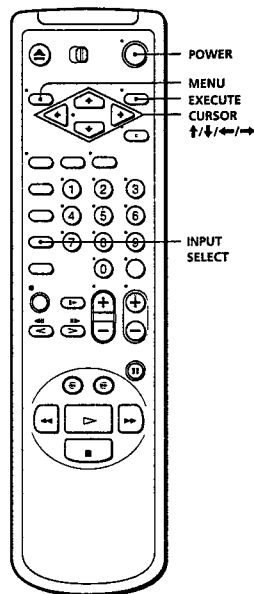
Basic Operations

## Recording TV programs using the timer

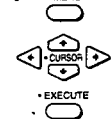
You can preset up to eight programs at a time

### Before you start ..

- Check that the VCR clock is set to the correct time
- Turn on your TV and set it to the video channel. When using a cable box, turn it on
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time



1



Press MENU and select TIMER SET/CHECK, then press EXECUTE

| TIMER SET / CHECK | 11  | 12  | SU  |
|-------------------|-----|-----|-----|
| DATE              | --- | --- | --- |
| START             | --- | --- | --- |
| STOP              | --- | --- | --- |
| CH                | --- | --- | --- |

2



Set the date, start and stop times, channel number and tape speed

- 1 Press CURSOR → to flash each item in turn
- 2 Press CURSOR ↑/↓ to set each item

To correct a setting, press CURSOR ← to return to that setting and reset

To record the same program every day or the same day every week, press CURSOR ↓ while the date is flashing. For details, see "Daily/weekly recording" on this page

To record from a source connected to the LINE IN jacks, press INPUT SELECT to display "L" in the "CH" position

| TIMER SET / CHECK | 11  | 12  | SU  |
|-------------------|-----|-----|-----|
| DATE              | --- | --- | --- |
| START             | --- | --- | --- |
| STOP              | --- | --- | --- |
| CH                | --- | --- | --- |

3



Press CURSOR → to confirm the setting

The cursor (→) appears at the beginning of the line. To enter another setting, move the cursor to the next line and repeat step 2

4



Press EXECUTE

5



Press POWER to turn off the VCR

The TIMER indicator on the VCR lights up and the VCR stands by for recording. When using a cable box, leave it on

### To stop recording

To stop the VCR while recording, press ■ STOP

### Daily/weekly recording

In step 2 above, press CURSOR ↓ to select the recording pattern. Each time you press CURSOR ↓, the indication changes as shown below

the current date → SU-SA → MO-SA → MO-FR → EVERY SA → . → EVERY MO → EVERY SU → 1 month later → (dates count down) → the current date

### Tips

- To set the channel, you can also use the CH+/- or number buttons
- To set the tape speed, you can also use TAPE SPEED

continued

## Recording TV programs using the timer (continued)

### To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press POWER. The TIMER indicator turns off and the VCR switches on. Remember to press POWER to reset the VCR in timer recording standby after using the VCR. You can also do the following tasks while the VCR is recording

- Reset the counter
- Display tape information on the TV screen
- Check the timer settings
- Watch another TV program

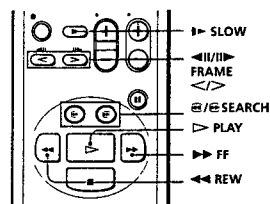
### To lock the VCR after setting the timer (Child Lock)

Hold down POWER on the VCR until the VCR beeps. The VCR turns off and the ○ indicator appears in the display window. The VCR will not work except for timer recording

To unlock the VCR, hold down POWER on the VCR until the VCR beeps. The VCR turns on and the ○ indicator disappears from the display window

## Additional Operations

## Playing/searching at various speeds



| Playback options                               | Operation                                                                                    |
|------------------------------------------------|----------------------------------------------------------------------------------------------|
| Fast-forward and rewind                        | During stop press ►► FF or ◄◄ REW                                                            |
| View the picture during fast-forward or rewind | During fast-forward, keep pressing ►► FF. During rewind keep pressing ◄◄ REW                 |
| Play at high speed                             | During playback or pause, press 🔍 SEARCH or 🔍 SEARCH. To change direction press ► or ◄       |
| Play in slow motion                            | During playback or pause, press ► SLOW. To change direction, press ► or ◄                    |
| Play frame by frame                            | During pause, press ►► FRAME or ◄◄ FRAME. Hold the button down to play one frame each second |
| Play in reverse                                | During playback press ◄                                                                      |
| Rewind and start play                          | During stop, press ►► PLAY on the VCR while pressing ◄◄ REW on the VCR                       |

### To resume normal playback

Press ►► PLAY

### Tip

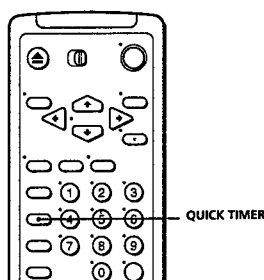
- Adjust the picture using the TRACKING +/- buttons on the VCR if
  - Streaks appear while playing in slow motion
  - The picture shakes while pausing

### Notes

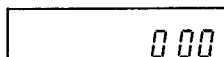
- The sound is muted during these operations
- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed
- The picture may have snow
  - when playing at high-speed in reverse
  - when playing in reverse slow motion
  - when playing in reverse

## Recording TV programs using the quick timer

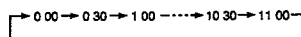
After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration



- 1 While recording, press QUICK TIMER once



- 2 Press QUICK TIMER repeatedly to set the duration  
Each press advances the time in increments of 30 minutes



The duration decreases minute by minute to 0 00, then the VCR stops recording and turns off automatically

### To extend the duration

Press QUICK TIMER repeatedly to set to the new duration

### To stop the VCR while recording

Press ■ STOP

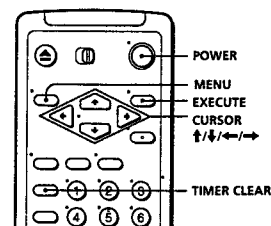
### Using the quick timer during stop mode

- 1 Press QUICK TIMER
- 2 Press CH +/- or INPUT SELECT to select the channel you want to record
- 3 Press QUICK TIMER repeatedly to set the recording duration  
The recording starts

## Checking/ changing/ canceling timer settings

Before you start ..

- Turn on your TV and set it to the video channel

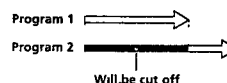


- 1 Press POWER to turn on the VCR
- 2 Press MENU and select TIMER SET/CHECK
  - If you want to change a setting, go on to the next step
  - If you do not need to change the settings, press EXECUTE, then turn off the VCR to return to recording standby
- 3 Press CURSOR ↑/↓ to select the setting you want to change or cancel
  - To change the setting, press CURSOR ←/→ to flash the item you want to change, and press CURSOR ↑/↓ to reset it. Then, press CURSOR → repeatedly until the cursor (▸) appears at the beginning of the line
  - To cancel the setting, press TIMER CLEAR
- 4 Press EXECUTE
  - If any timer settings remain, turn off the VCR to return to recording standby

| TIMER SET/CHECK | 11/16          | SU        |
|-----------------|----------------|-----------|
| DATE            | START          | STOP      |
| 11/17           | MO 7 00W       | 8 00W 85  |
| 1/28            | TU 9 30W       | 15N 50P   |
| MO - SA         | 1 00W 3 00W 1E |           |
| EVERY SU        | 11 55W         | 1 30W 42F |
| - / -           | -              | -         |
| - / -           | -              | -         |
| - / -           | -              | -         |
| - / -           | -              | -         |

### When the timer settings overlap

The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority.



## Recording stereo and bilingual programs

### Recording stereo programs

This VCR automatically receives and records stereo programs. When a stereo program is received, the STEREO indicator lights up. If there is noise in the stereo program, set AUTO STEREO in the ADVANCED OPTIONS menu to OFF. The sound will be recorded in monaural (on both hi-fi and normal audio tracks) but with less noise. For details, see page 37.

### Recording bilingual programs

Normally, this VCR records only the main sound. When a SAP (Second Audio Program) is received, the SAP indicator lights up. To record only SAP sound, set TUNER AUDIO in the ADVANCED OPTIONS menu to SAP. For details, see page 37.

### Selecting the sound while playing

Press AUDIO MONITOR to select the desired sound. (The sound being recorded will not change.)

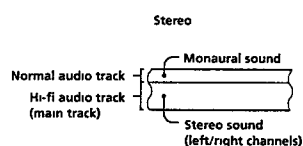
#### Stereo program

| To listen to                              | Indicator on the TV screen |
|-------------------------------------------|----------------------------|
| Stereo                                    | STEREO                     |
| Left channel                              | L                          |
| Right channel                             | R                          |
| Monaural sound on the normal audio track* | No indicator appears       |

\* Usually the mixed sound of left and right channels

### How sound is recorded on a video tape

The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.



#### Notes

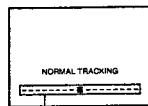
- To play a tape in stereo, you must use the A/V connections
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting

## Adjusting the picture

### Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the tracking indicator  flashes in the display window; then goes off), distortion may occur if the tape was recorded in poor condition. In this case, manually adjust the tracking.

Press the TRACKING +/- buttons on the VCR to display the tracking meter. The distortion should disappear as you press one of the two buttons (the  indicator lights up). To resume automatic tracking adjustment, eject the tape and reinsert it.



Tracking meter

### About Adaptive Picture Control (APC)

Adaptive Picture Control (APC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the ADVANCED OPTIONS menu (with the APC indicator in the display window lit).

#### APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

#### APC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

#### Notes

- The auto tracking adjustment cannot be used on tapes recorded in the LP mode on other VCRs.
- The APC function doesn't work if the tape speed is automatically changed from the SP to EP mode during a timer recording, unless the tape has been recorded in the EP mode with the APC function.
- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyzes the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press  REC to have the VCR analyze the tape. After the APC indicator stops flashing, press  PAUSE to start recording immediately. If you press  PAUSE before the APC indicator stops flashing, the APC function is canceled.

## Changing menu options

- Press MENU and select ADVANCED OPTIONS.

| ADVANCED OPTIONS |      |     |  |
|------------------|------|-----|--|
| AUTO STEREO      | ON   | OFF |  |
| TUNER AUDIO      | MAIN | SAP |  |
| APC              | ON   | OFF |  |
| TAPE SELECT      | AUTO | 180 |  |
| AUTO TAPE SPEED  | ON   | OFF |  |
| SHARPNESS        | L    | H   |  |

- Press CURSOR / to select the option to change, then press CURSOR / to change the setting.
- Press EXECUTE to return to the original screen.

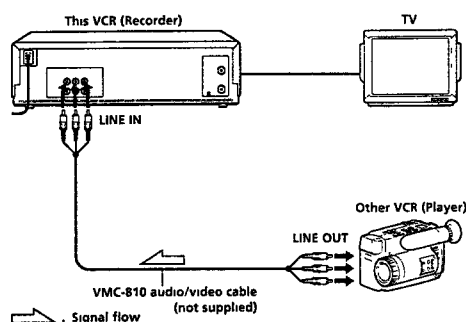
#### Menu choices

Initial settings are indicated in bold print.

| Menu option     | Set this option to                                                                                                                                                               |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AUTO STEREO     | <b>ON</b> to receive stereo programs. OFF to reduce noise, the sound changes to monaural.                                                                                        |
| TUNER AUDIO     | <b>MAIN</b> to record the main sound, SAP to record the SAP (Second Audio Program) sound.                                                                                        |
| APC             | <b>ON</b> to switch on the APC (Adaptive Picture Control) function and improve picture quality, OFF to switch off APC.                                                           |
| TAPE SELECT     | <b>AUTO</b> or 180 (when using a T-140, T-180 or longer tape) to select the tape length and display the remaining time correctly.                                                |
| AUTO TAPE SPEED | <b>ON</b> to change the timer recording tape speed automatically to the EP mode when the remaining tape becomes shorter than the recording time, OFF to keep the set tape speed. |
| SHARPNESS       | L (Low) through H (High) to adjust the sharpness of the picture. L to turn off the sharpness control.                                                                            |

## Editing with another VCR

### How to hook up to record on this VCR



### How to hook up to a stereo system

Connect LINE IN AUDIO on this VCR to the audio output jacks on the stereo system, using the RK-C510KS audio cable (not supplied).

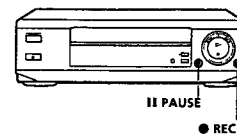
#### Notes

- Make sure you connect the plugs to jacks of the same color.
- If the other VCR is a monaural type, use a connecting cable such as Sony VMC-910MS.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.

### Operation (when recording on this VCR)

#### Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT on the remote commander to display "L" in the display window.
- Press TAPE SPEED on the remote commander to select the tape speed, SP or EP.



- Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.
- Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press  PAUSE.
- Press  REC on this VCR and set it to recording pause.
- To start editing, press the  PAUSE buttons on both VCRs at the same time.

#### To stop editing

Press the  STOP buttons on both VCRs.

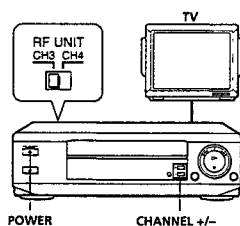
#### Note

- If you start recording following the procedure above, the VCR won't start recording with the APC function. To record a tape with the APC function, press  REC again during recording pause in step 3 so that the VCR analyzes the tape. Then when you start recording in step 4, press  PAUSE immediately after the APC indicator stops flashing. If you press  PAUSE before the APC indicator stops flashing, the APC function is canceled.

## General setup information

### Setting the RF unit

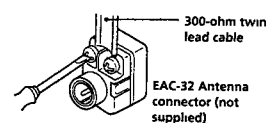
When connecting the VCR to the TV using only the antenna cable, you must set the RF UNIT switch on the rear of the VCR so that the TV can receive the correct signal from the VCR.



- 1 Set the RF UNIT switch on the rear of the VCR to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.
  - 2 Press POWER to turn on the VCR.
  - 3 Press TV/VTR on the remote commander to turn on the VTR indicator in the VCR's display window.
  - 4 Press CHANNEL +/- to display a channel number in the display window. Select an active channel number in your area.
  - 5 Turn on your TV and set it to the channel you selected in step 1 (channel 3 or 4).
- The selected TV channel broadcast appears on the TV screen. If the channels change when you press CHANNEL +/-, you have made the correct setting.
- Whenever you use the VCR, set the TV to the channel selected in step 1.

### Attaching the external antenna connector

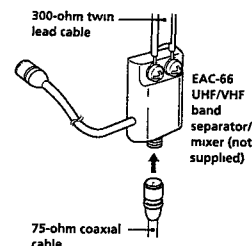
When using a 300-ohm twin lead cable for VHF/UHF antenna, use the EAC-32 antenna connector (not supplied) to connect the antenna to the VCR.



- 1 Loosen the screws on the antenna connector.
- 2 Wind the twin leads around the screws on the antenna connector.
- 3 Retighten the screws.

### Attaching a UHF/VHF band mixer

When using both 75-ohm coaxial cable and 300-ohm twin lead cable for VHF/UHF antenna, use the EAC-66 UHF/VHF band separator/mixer (not supplied) to connect the antenna to the VCR.

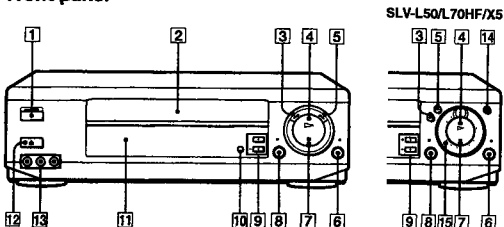


- 1 Loosen the screws on the mixer.
- 2 Wind the twin leads around the screws on the mixer.
- 3 Retighten the screws.
- 4 Connect the 75-ohm coaxial cable to the mixer.

## Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

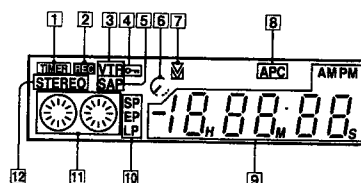
### Front panel



- |                           |                                                            |
|---------------------------|------------------------------------------------------------|
| 1 POWER switch/indicator  | 8 II PAUSE button (23, 39)                                 |
| 2 Tape compartment        | 9 CHANNEL/TRACKING +/- buttons (26, 31, 36)                |
| 3 << REW button (23, 31)  | 10 EASY SET UP button (10, 12, 14, 16)                     |
| 4 >> PLAY button (23, 31) | 11 Remote sensor (5)                                       |
| 5 >>> FF button (23, 31)  | 12 EJECT button (23)                                       |
| 6 ● REC button (26, 39)   | 13 LINE-2 IN AUDIO/VIDEO jacks (SLV-495/L50/X5)            |
| 7 ■ STOP button (23, 26)  | 14 LINE-2 IN AUDIO L/R/VIDEO jacks (SLV-685HF/695HF/L70HF) |
|                           | 15 JOG button (SLV-L50/L70HF/X5)                           |
|                           | 16 CLICK JOG SHUTTLE ring (SLV-L50/L70HF/X5)               |

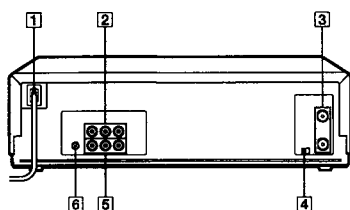
### Index to parts and controls (continued)

#### Display window



- |                                                                          |                                                      |
|--------------------------------------------------------------------------|------------------------------------------------------|
| 1 TIMER indicator (29)                                                   | 8 APC indicator (36)                                 |
| 2 REC (recording) indicator                                              | 9 Time counter/clock/line/channel indicator (24, 26) |
| 3 VTR indicator (27)                                                     | 10 Tape speed indicator (26)                         |
| 4 (Child Lock) indicator (30)                                            | 11 Tape indicator                                    |
| 5 SAP indicator (34)                                                     | 12 STEREO indicator (34)                             |
| 6 Remaining time indicator (26) (EXCEPT SLV-L40/L50/L60HF/L70HF/X5/X6HF) |                                                      |
| 7 (tracking) indicator (36)                                              |                                                      |

## Rear panel



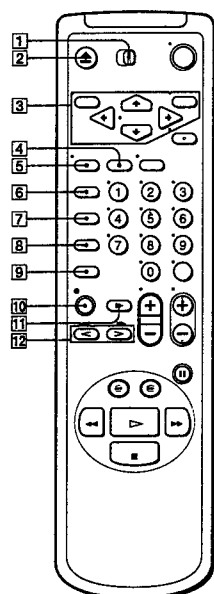
- |                                                                                                                                |                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| 1 AC power cord                                                                                                                | 4 RF UNIT switch (40)                                           |
| 2 LINE IN or LINE-1 IN<br>AUDIO/VIDEO jacks (Mono model)<br>LINE IN or LINE-1 IN<br>AUDIO L/R/VIDEO jacks<br>(38) (HiFi model) | 5 LINE OUT AUDIO L/R/VIDEO<br>jacks (8)                         |
| 3 VHF/UHF IN/OUT connectors (9,<br>11, 13, 15)                                                                                 | 6 CABLE BOX CONTROL CTRL<br>S OUT jack<br>(SLV-495/685HF/695HF) |

continued

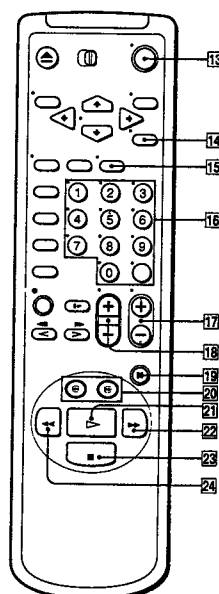
Additional Information | 47

## Index to parts and controls (continued)

### Remote commander



- |                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------|
| 1 TV / VTR remote control switch<br>(5)                                                                                           |
| 2 EJECT button (23)                                                                                                               |
| 3 Menu operation buttons (17, 37)<br>MENU button<br>CURSOR $\uparrow/\downarrow/\leftarrow/\rightarrow$ buttons<br>EXECUTE button |
| 4 COUNTER RESET button (24)                                                                                                       |
| 5 DISPLAY button (26)                                                                                                             |
| 6 TIMER CLEAR button (33)                                                                                                         |
| 7 QUICK TIMER button (32)                                                                                                         |
| 8 INPUT SELECT button (27, 29, 39)                                                                                                |
| 9 TAPE SPEED button (26)                                                                                                          |
| 10 REC button (26, 39)                                                                                                            |
| 11 SLOW button (31)                                                                                                               |
| 12 $\ll/\gg$ FRAME $\ll/\gg$ buttons (31)                                                                                         |

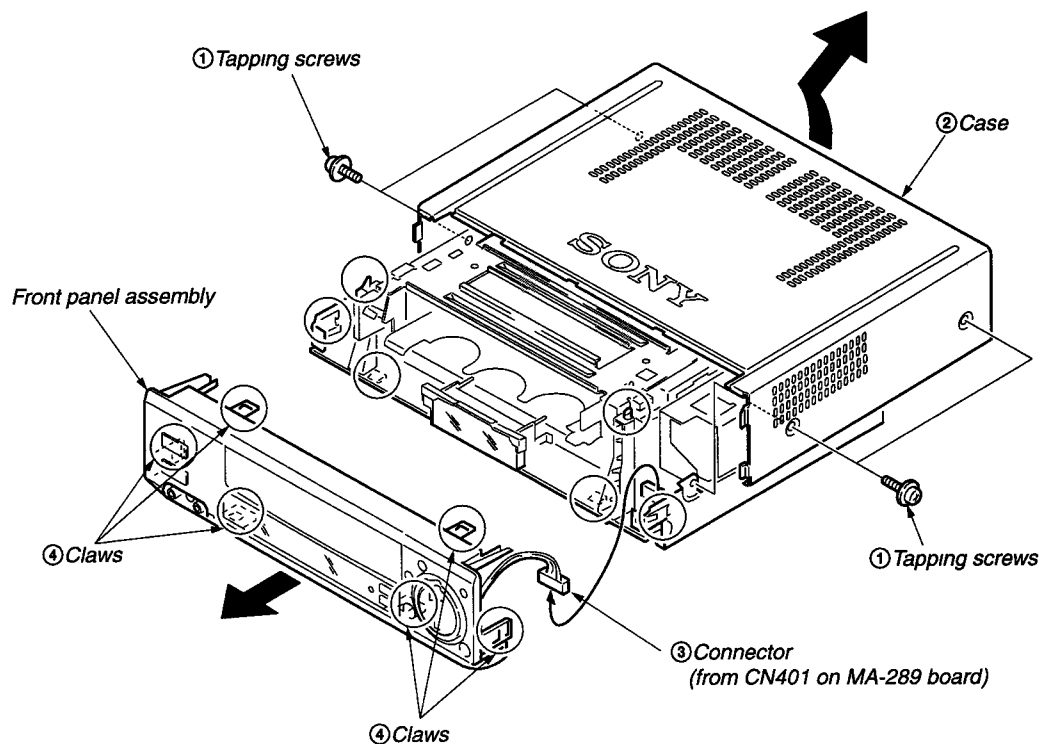


- |                                             |
|---------------------------------------------|
| 13 POWER switch (29)                        |
| 14 AUDIO MONITOR button (34)                |
| 15 TV/VTR button (27)                       |
| 16 Channel number/ENTER buttons<br>(21, 22) |
| 17 CH $\pm$ buttons (21, 26)                |
| 18 VOL $\pm$ buttons                        |
| 19 PAUSE button (23)                        |
| 20 SEARCH buttons (23, 31)                  |
| 21 PLAY button (23, 31)                     |
| 22 FF button (23, 31)                       |
| 23 STOP button (23, 26)                     |
| 24 REW button (23, 31)                      |

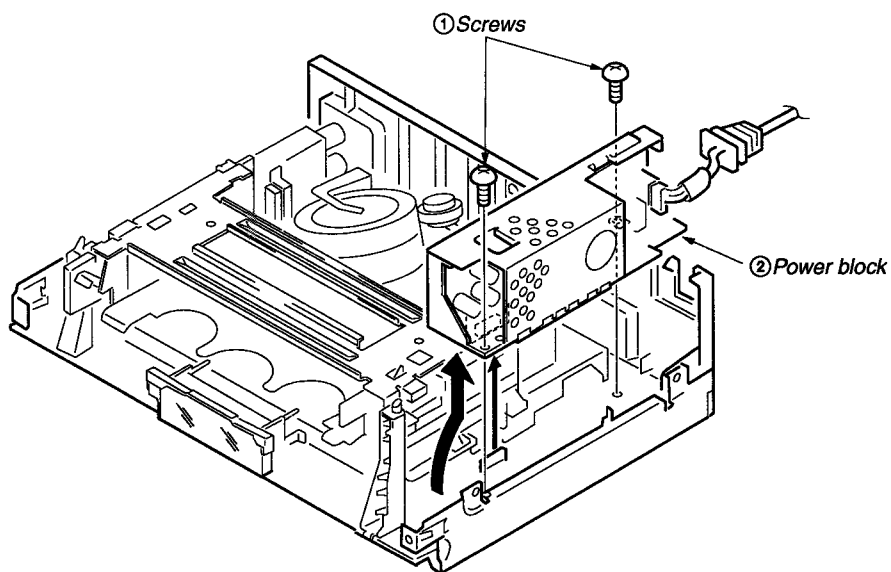
## SECTION 2 DISASSEMBLY

NOTE : Follow the disassembly procedure in the numerical order given.

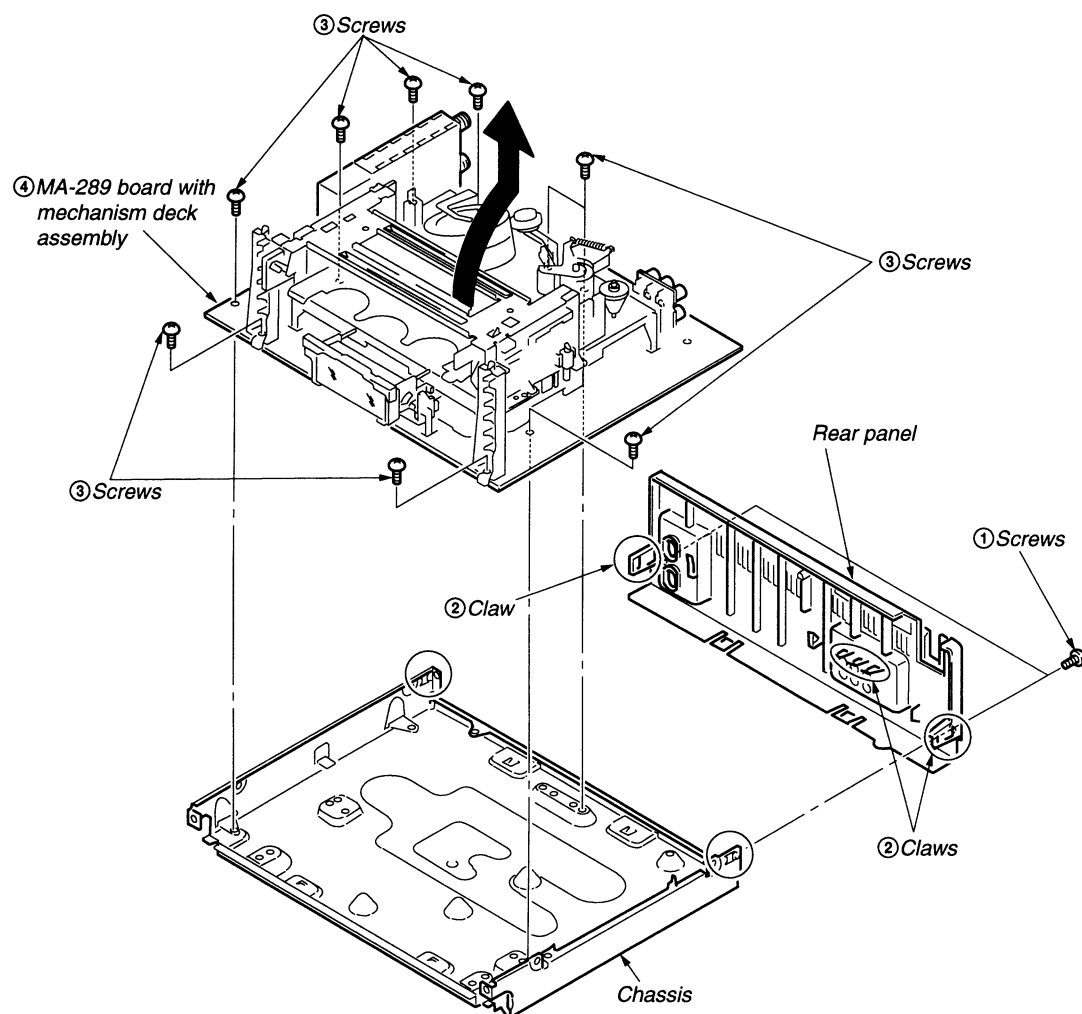
### 2-1. CASE AND FRONT PANEL ASSEMBLY



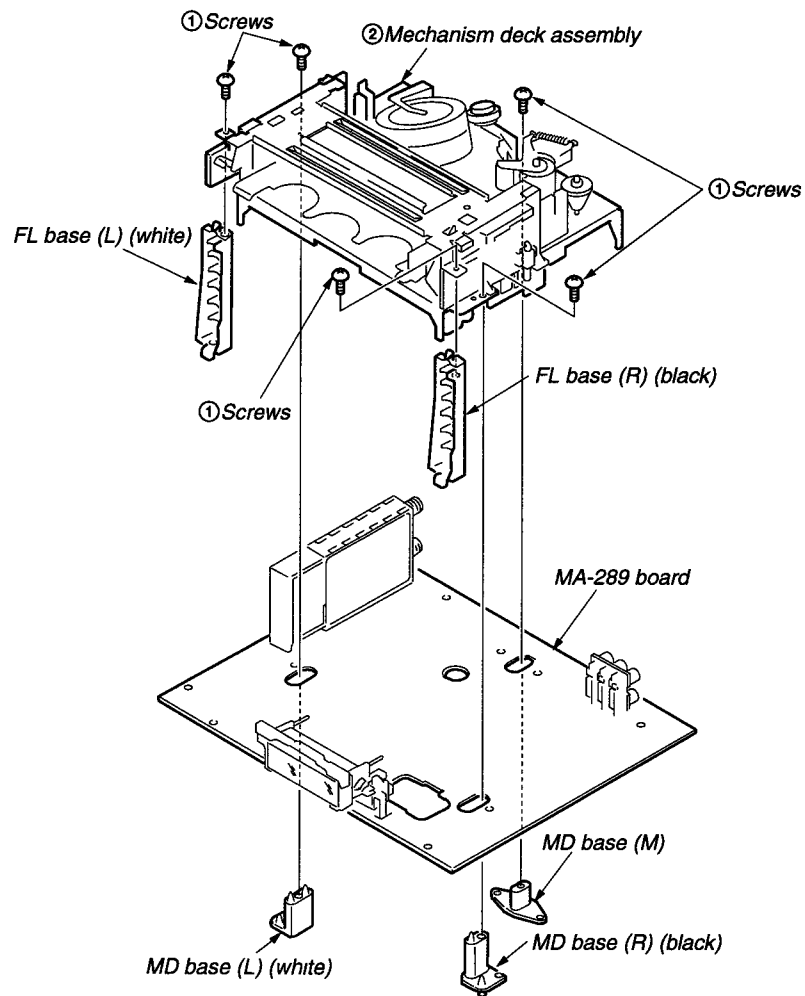
### 2-2. POWER BLOCK



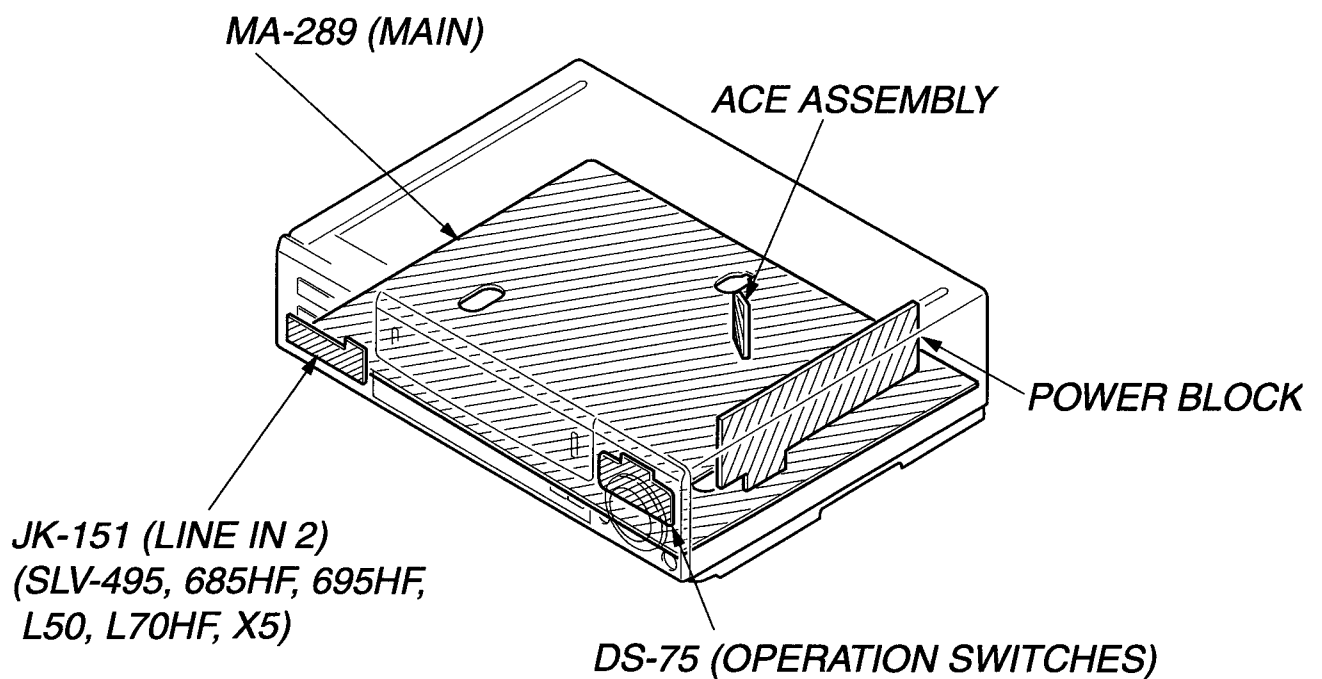
## 2-3. MA-289 BOARD WITH MECHANISM DECK ASSEMBLY



## 2-4. MECHANISM DECK ASSEMBLY



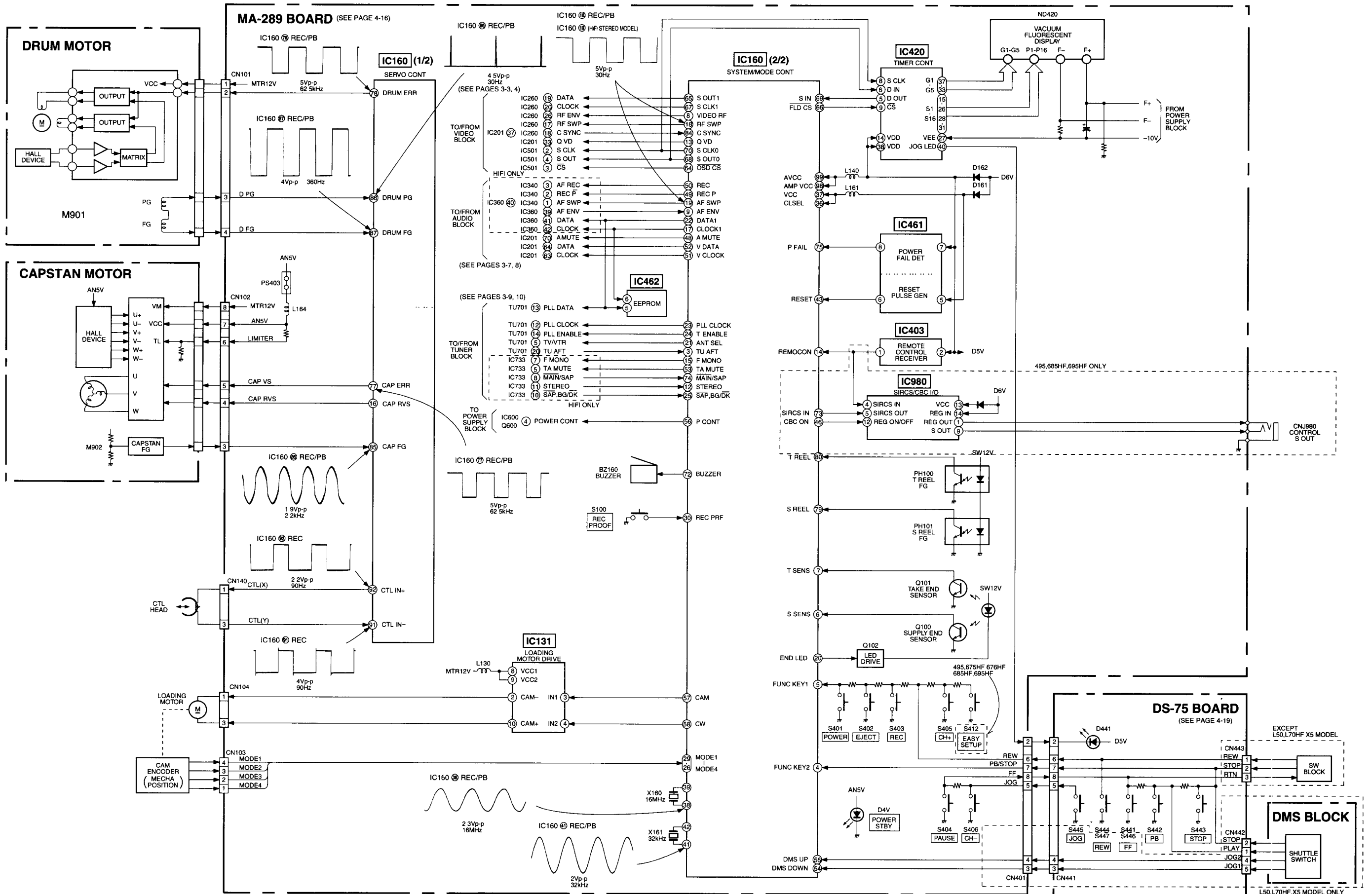
## 2-5. CIRCUIT BOARDS LOCATION



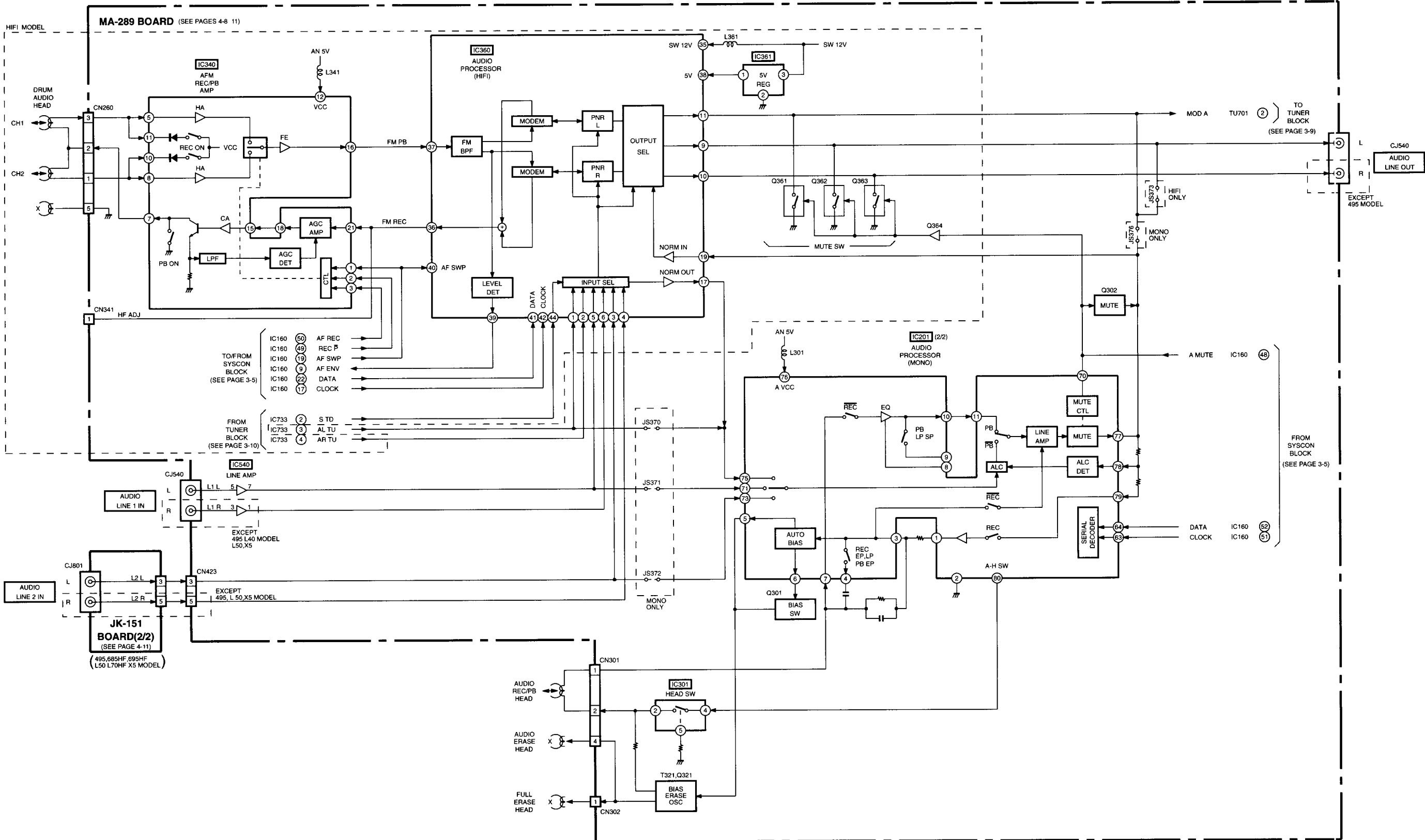




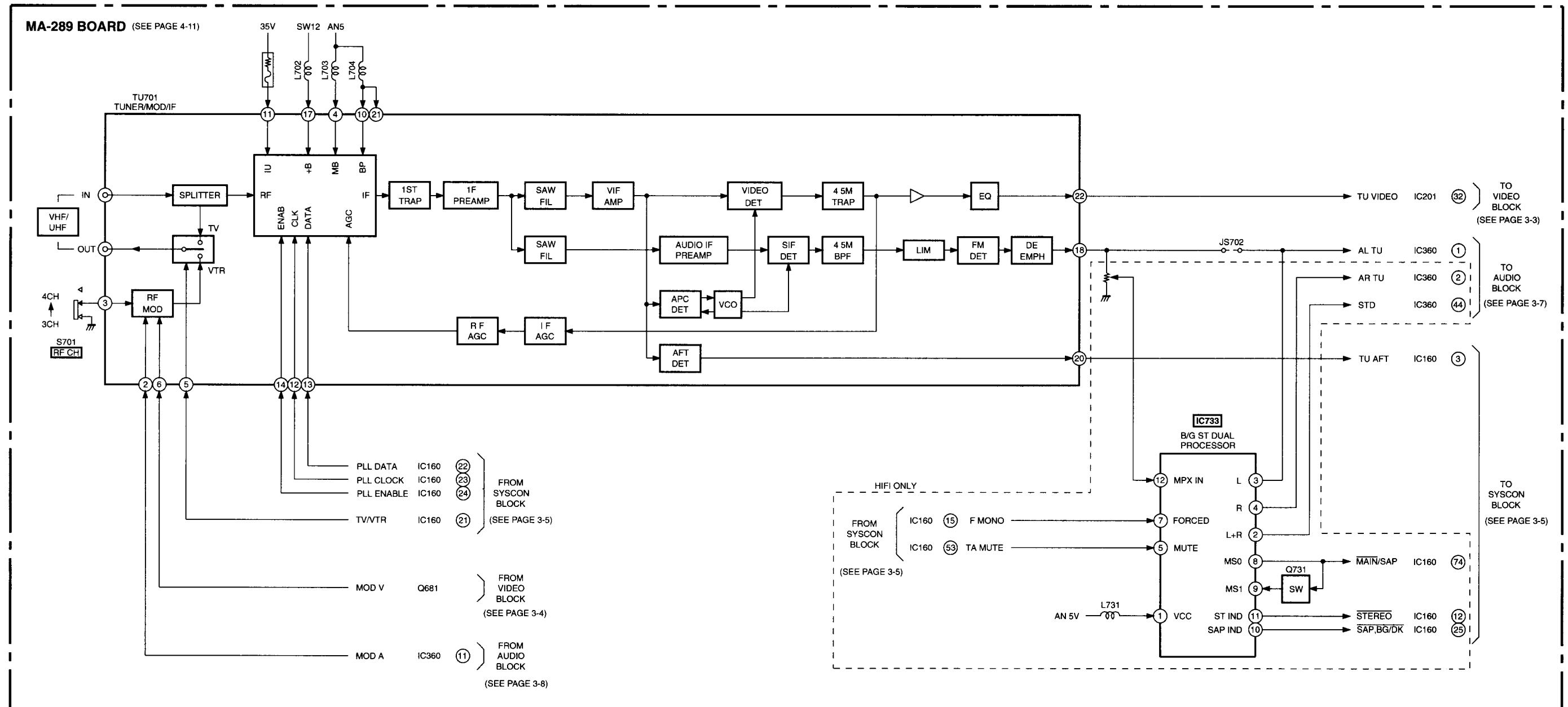
### 3-3. SERVO, SYSTEM CONTROL BLOCK DIAGRAM



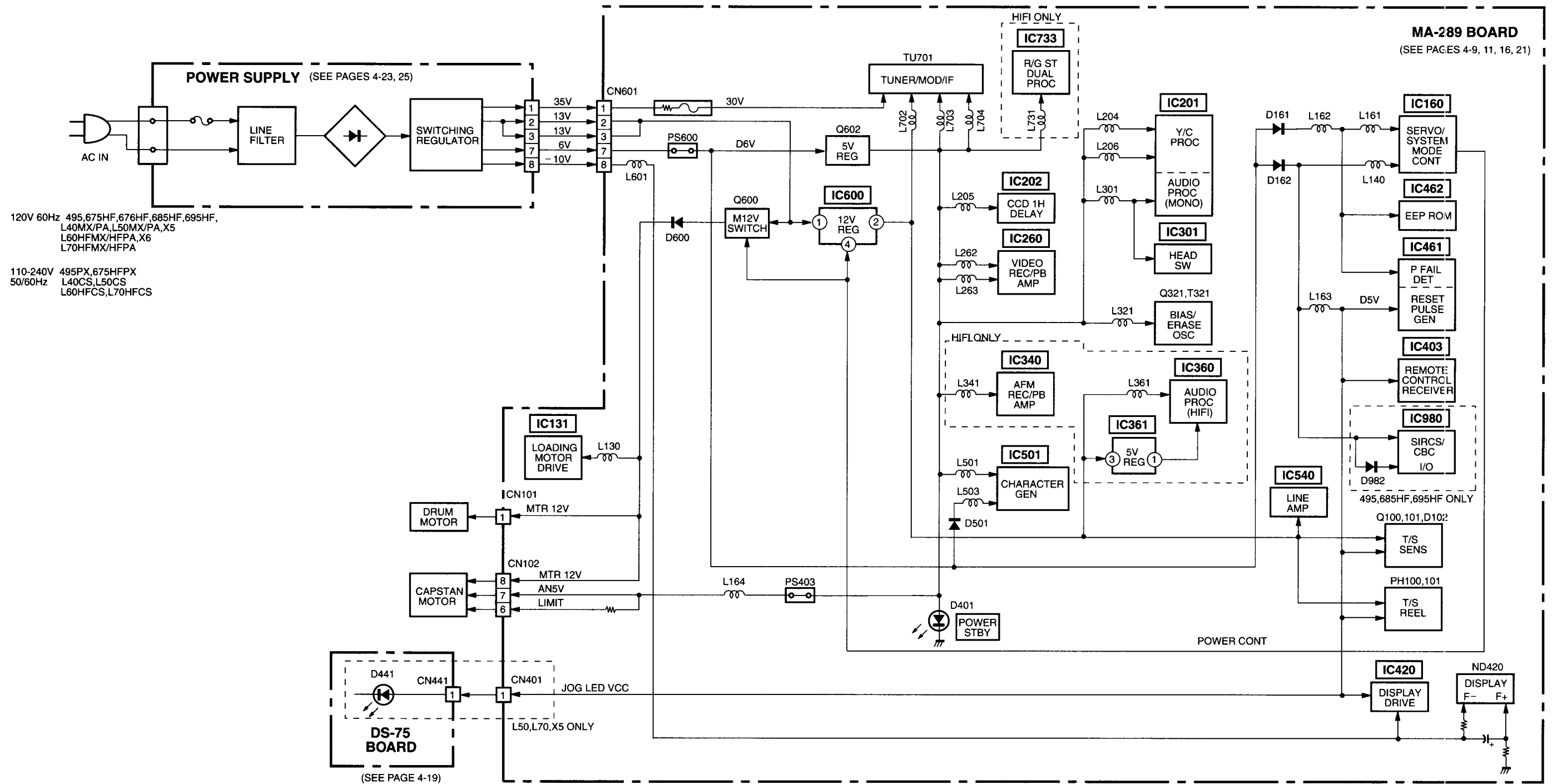
### 3-4. AUDIO BLOCK DIAGRAM



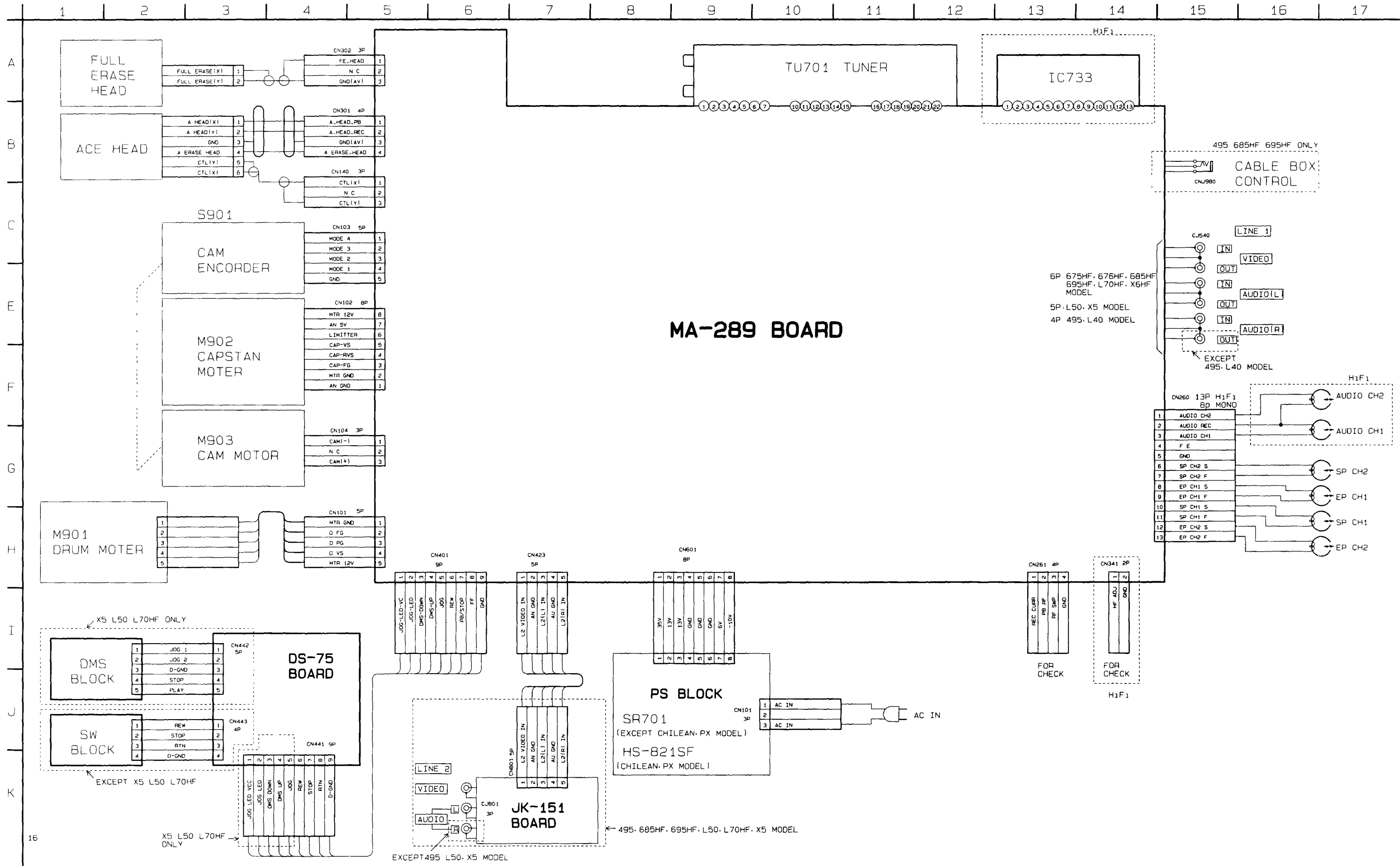
### 3-5. TUNER BLOCK DIAGRAM



### 3-6. POWER SUPPLY BLOCK DIAGRAM



SECTION 4  
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS  
4-1. FRAME SCHEMATIC DIAGRAM



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS. (In addition to this, the necessary note is printed in each block.)

- For printed wiring boards.
- : Pattern from the side which enables seeing.

**Caution :**  
Pattern face side. Parts on the pattern face side (Conductor Side) seen from the pattern face are indicated.  
Pattern face side: parts on the parts face side seen (Component Side) from the parts face are indicated

- For schematic diagrams.
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistor are in ohms, 1/4W unless otherwise noted. Chip resistor are 1/10W unless otherwise noted. k $\Omega$ : 1000 $\Omega$ , M $\Omega$ , 1000k $\Omega$ .
- All capacitors are in  $\mu$ F unless otherwise noted. pF  $\cdot$   $\mu$ F. 50V or less are not indicated except for electrolytics and tantalums.
- : panel designation
- $\Delta$  internal component.
- : B+Line. \*
- : B+Line \*
- : IN/OUT direction of (+,-) B LINE \*
- Circled numbers refer to waveforms. \*
- Readings are taken with a color-bar signal input.
- Voltage are dc between ground and measurement points \*
- Readings are taken with a digital multimeter (DC10M $\Omega$ ).\*
- Voltage variations may be noted due to normal production tolerances.\*

When indicating parts by reference number, please include the board name.

- \* : indicated by the color red.

SLV-495/495PX/675HF/675HFPX/676HF/685HF/695HF/L40CS/L40MX/L40PA/L50CS/L50MX/  
L50PA/L60HFC/L60HFMX/L60HFP/L70HFC/L70HFMX/L70HFP/X5MX/X6HFMX

MA-289 (MAIN) PRINTED WIRING BOARD  
— Ref. No. MA-289 Board, 1,000 Series —

MA-289 BOARD

|       |      |       |      |
|-------|------|-------|------|
| CJ540 | A-4  | IC403 | I-9  |
| CN980 | A-3  |       |      |
| CN101 | A-7  | IC420 | H-7  |
| CN102 | D-3  | IC461 | H-9  |
| CN103 | F-3  | IC462 | F-9  |
|       |      | IC501 | A-2  |
| CN104 | G-3  | IC540 | A-3  |
| CN140 | H-12 |       |      |
| CN260 | A-10 | IC600 | G-2  |
| CN261 | A-8  | IC733 | G-13 |
| CN301 | A-5  | IC980 | A-1  |

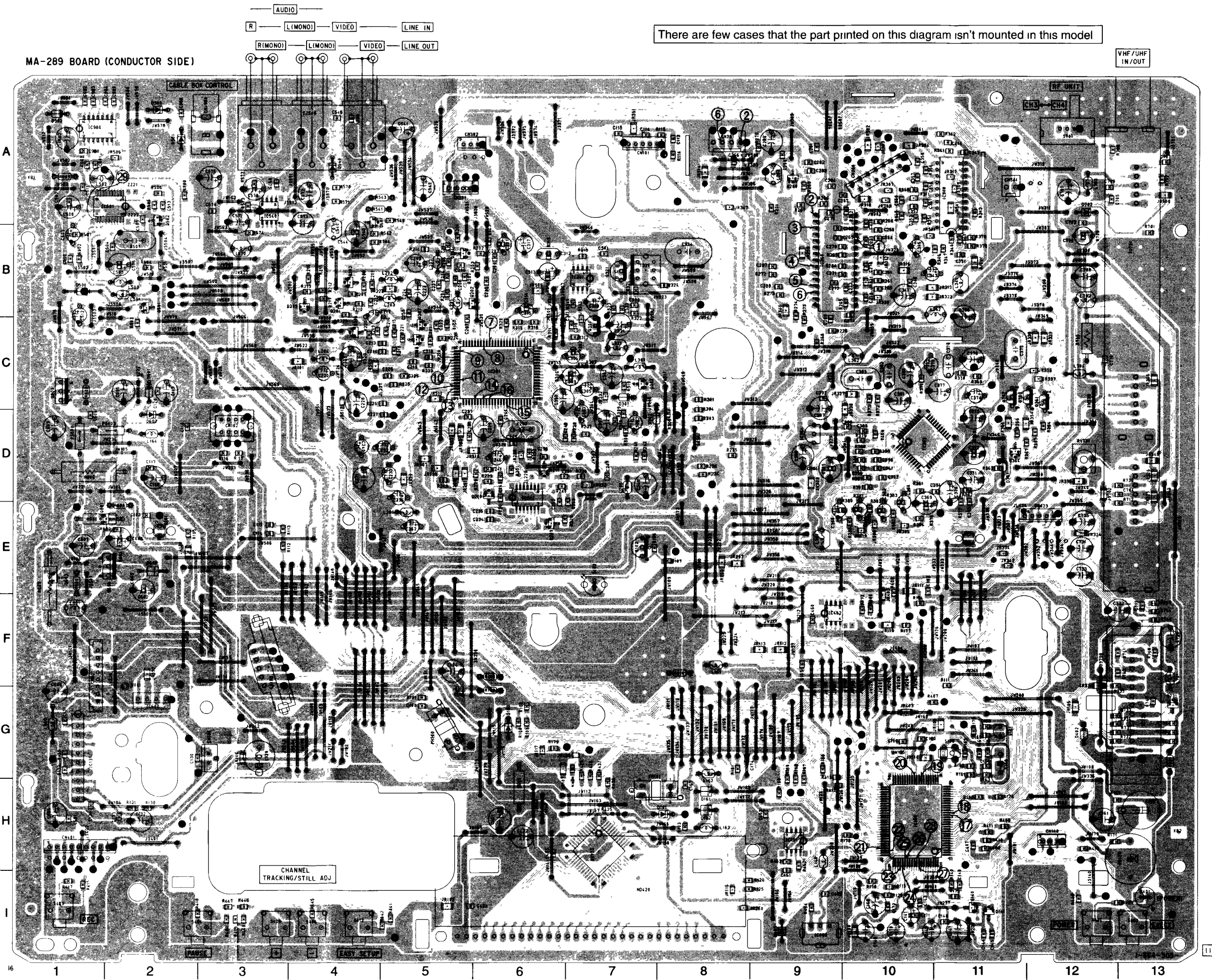
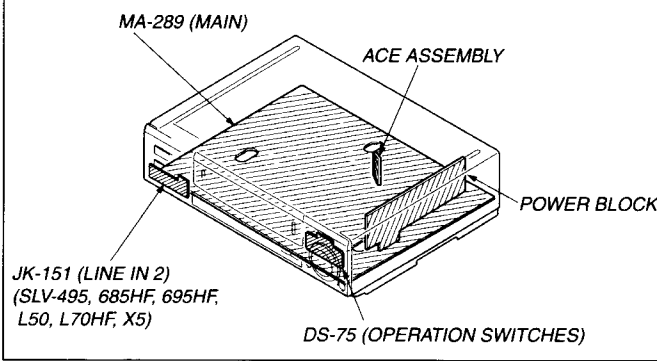
|       |      |       |     |
|-------|------|-------|-----|
| CN302 | A-5  |       |     |
| CN341 | A-11 | PH100 | G-5 |
| CN401 | H-1  | PH101 | H-8 |
| CN423 | E-12 |       |     |
| CN601 | F-1  |       |     |

|      |      |      |      |
|------|------|------|------|
| D102 | E-7  | Q100 | E-11 |
| D161 | H-8  | Q101 | E-2  |
| D162 | H-8  | Q102 | E-7  |
| D301 | C-7  | Q201 | B-5  |
| D302 | D-8  | Q202 | B-6  |
|      |      | Q208 | C-5  |
| D361 | D-11 | Q209 | E-6  |
| D401 | I-13 | Q210 | D-6  |
| D501 | B-1  | Q211 | D-6  |
| D540 | A-4  | Q260 | A-9  |
| D600 | E-2  |      |      |

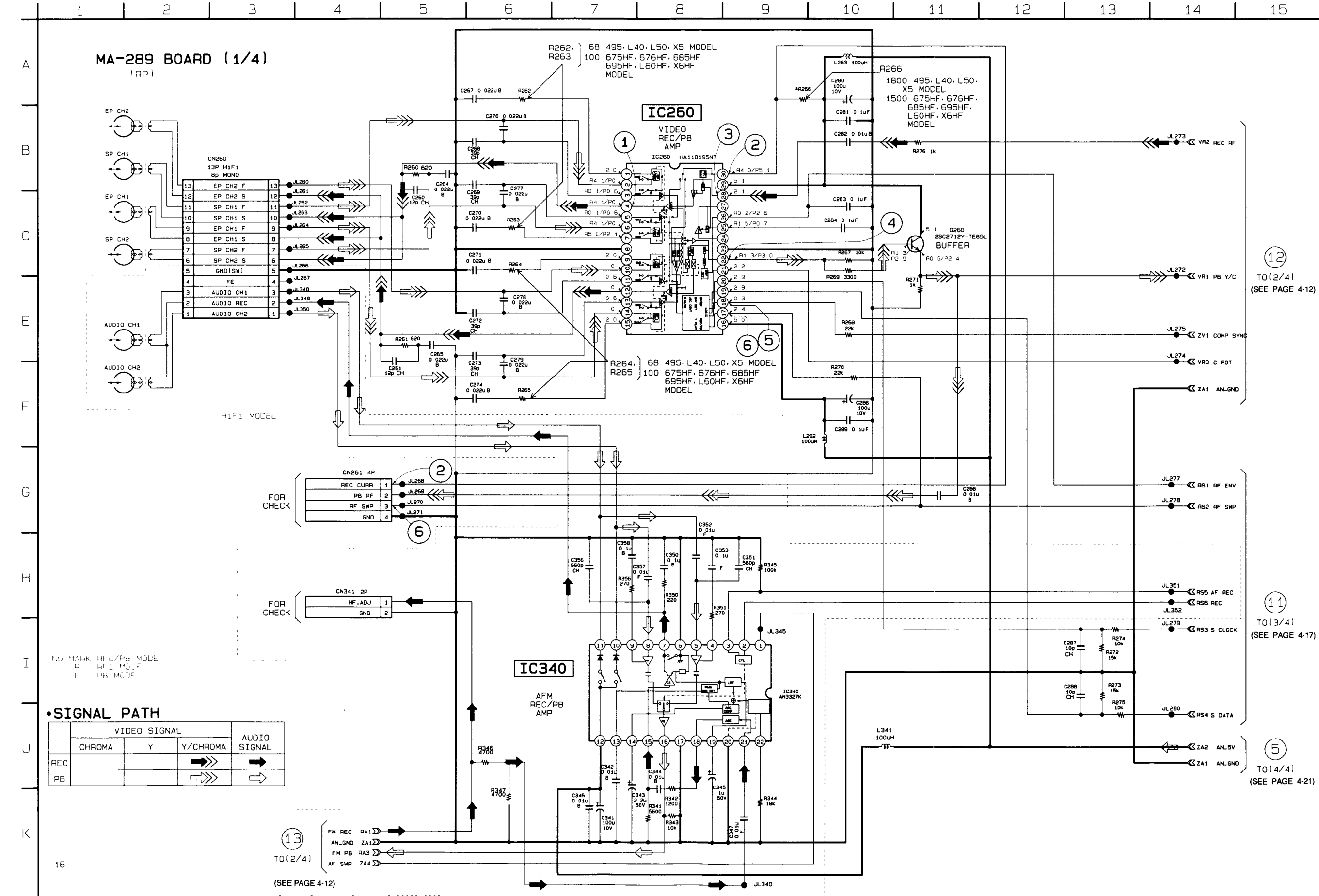
|      |      |      |      |
|------|------|------|------|
| D601 | C-2  | Q301 | C-7  |
| D602 | D-2  | Q302 | C-7  |
| D702 | A-12 | Q361 | C-12 |
| D980 | A-2  | Q362 | C-11 |
| D981 | A-2  | Q363 | C-12 |
| D982 | A-1  | Q364 | D-11 |
|      |      | Q501 | B-2  |
|      |      | Q502 | A-2  |
|      |      | Q600 | E-2  |

|       |      |      |      |
|-------|------|------|------|
| IC131 | G-1  | Q601 | E-2  |
| IC160 | H-10 | Q602 | C-1  |
| IC201 | C-6  | Q681 | A-4  |
| IC202 | D-6  | Q731 | G-13 |
| IC260 | B-9  |      |      |

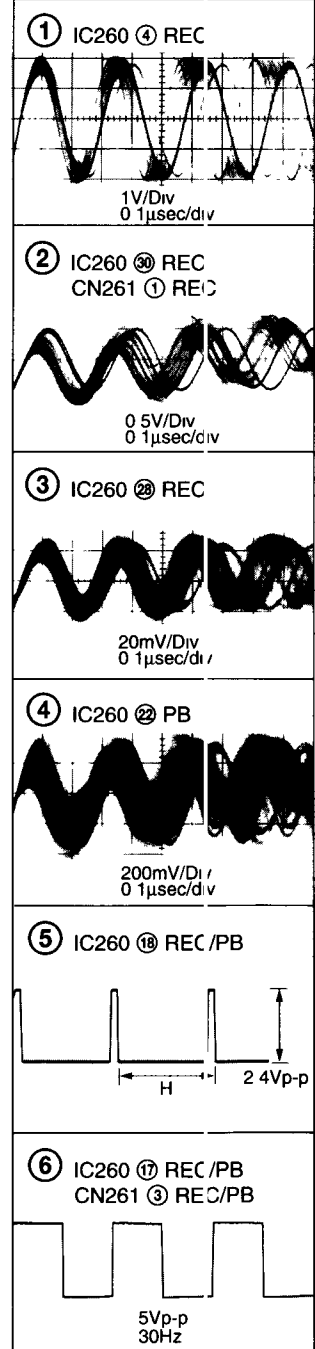
|       |      |  |  |
|-------|------|--|--|
| IC301 | B-7  |  |  |
| IC340 | A-11 |  |  |
| IC360 | D-10 |  |  |
| IC361 | D-9  |  |  |

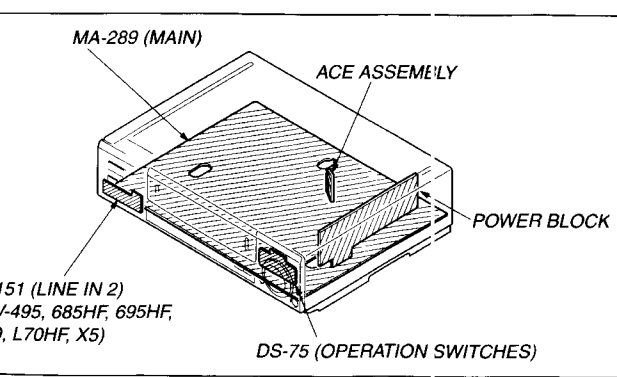
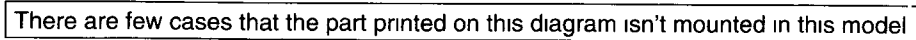


MA-289 (REC/PB AMP) SCHEMATIC DIAGRAM  
— Ref. No. MA-289 Board, 1,000 Series —



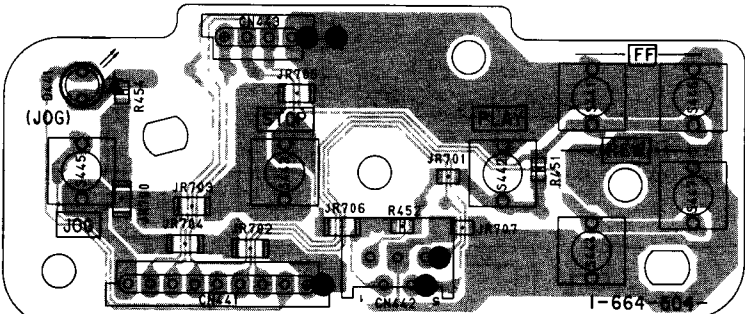
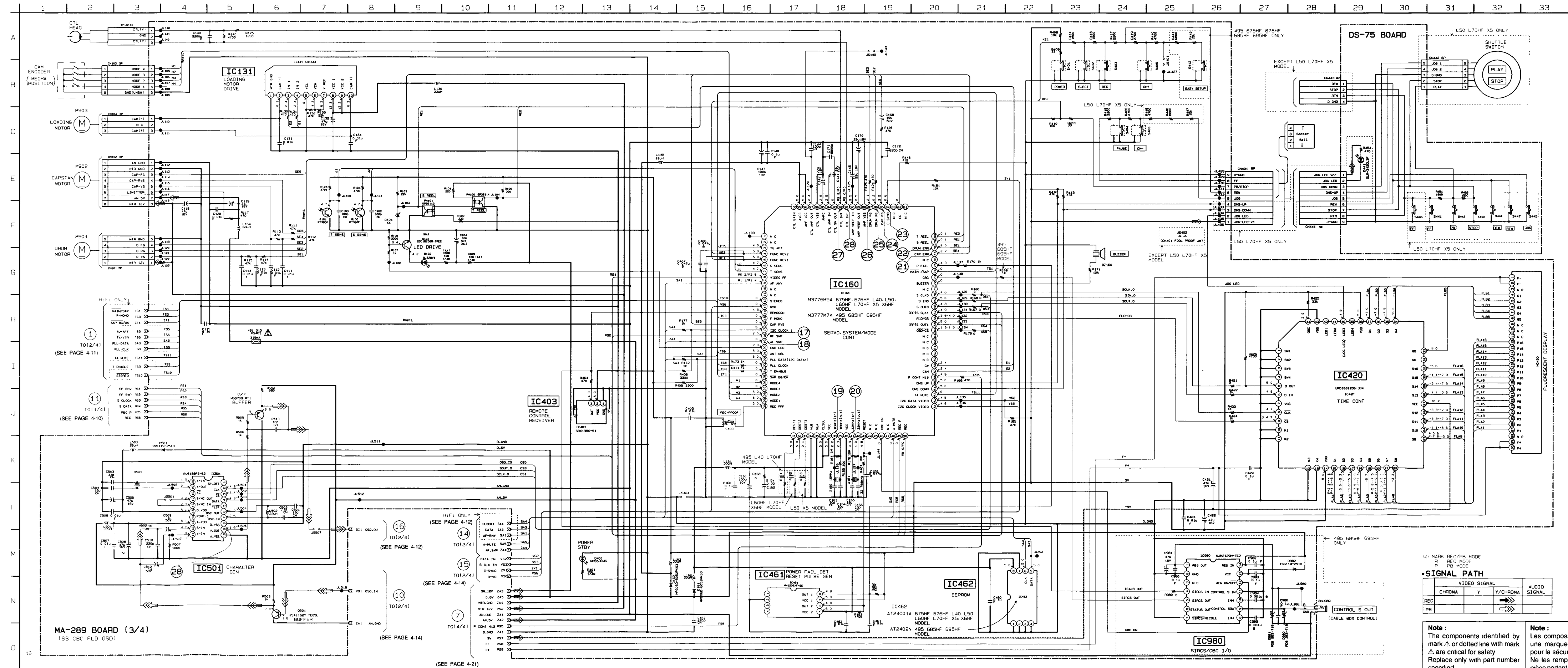
MA-289 BOARD (1/3)





There are few cases that the part printed on this diagram isn't mounted in this model

**MA-289 (SERVO, SYSTEM CONTROL), DS-75 (OPERATOR SWITCHES) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM**  
— Ref. No MA-289 Board, 1,000 Series, DS-75 Board, 1,000 Series —



NO MARK REC/PB MODE  
R REC MODE  
P PB MODE

• **SIGNAL PATH**

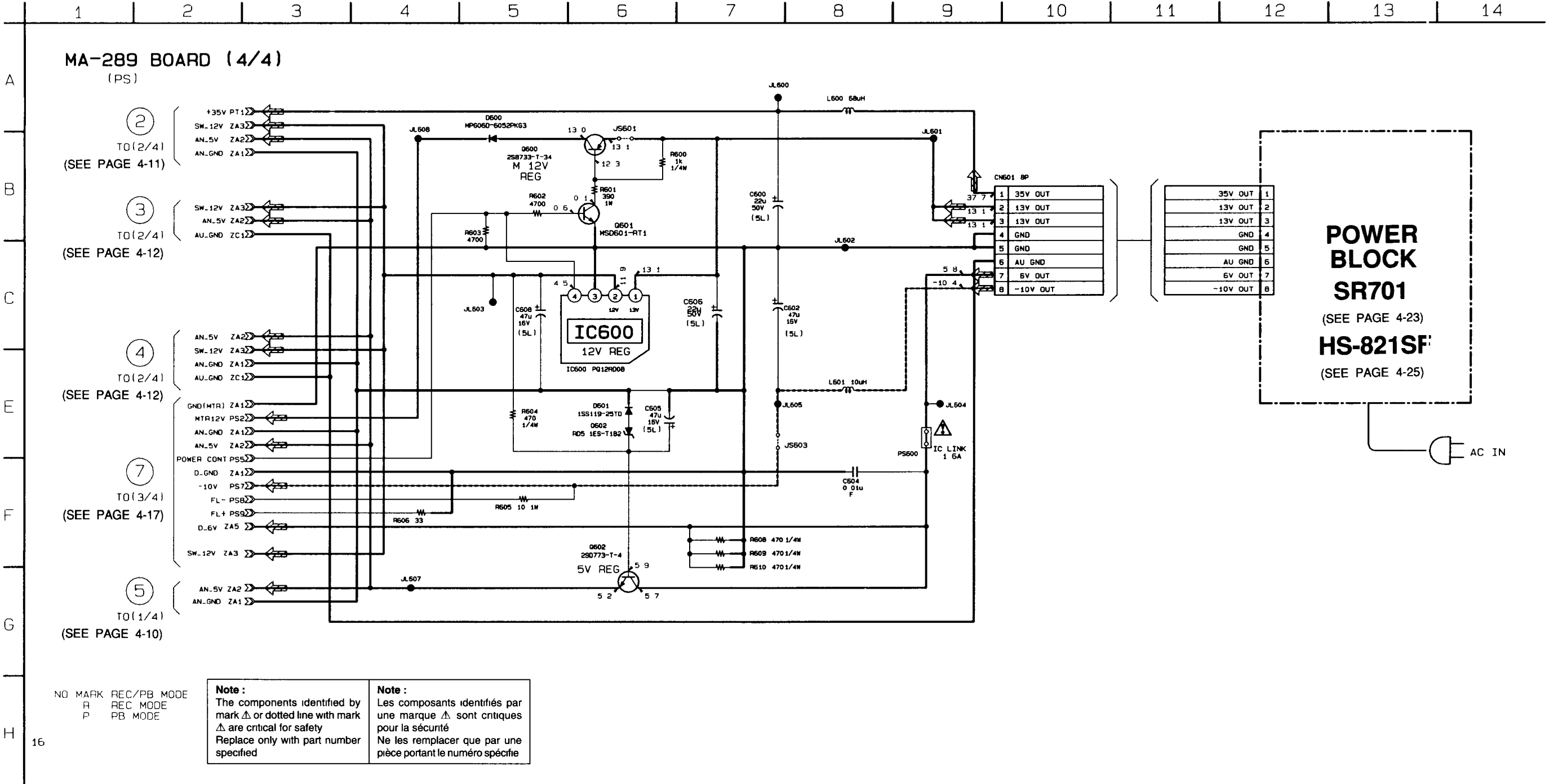
|     | VIDEO SIGNAL |   |          | AUDIO SIGNAL |
|-----|--------------|---|----------|--------------|
|     | CHROMA       | Y | Y/CHROMA |              |
| REC |              |   | ➡        |              |
| PB  |              |   | ➡➡➡      |              |

|                                                                                                                                                                                                                   |                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Note :</b><br/>         The components identified by mark <math>\Delta</math> or dotted line with mark <math>\Delta</math> are critical for safety<br/>         Replace only with part number specified</p> | <p><b>Note :</b><br/>         Les composants identifiés par une marque <math>\Delta</math> sont critiques pour la sécurité<br/>         Ne les remplacer que par une pièce portant le numéro spécifié</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Note :**  
Les composants identifiés par une marque  sont critiques pour la sécurité  
Ne les remplacer que par une pièce portant le numéro spécifique

MA-289 (POWER SUPPLY) SCHEMATIC DIAGRAM  
— Ref No. MA-289 Board; 1,000 Series —

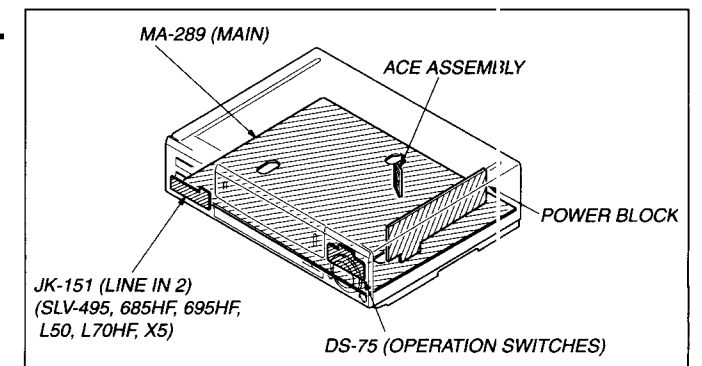
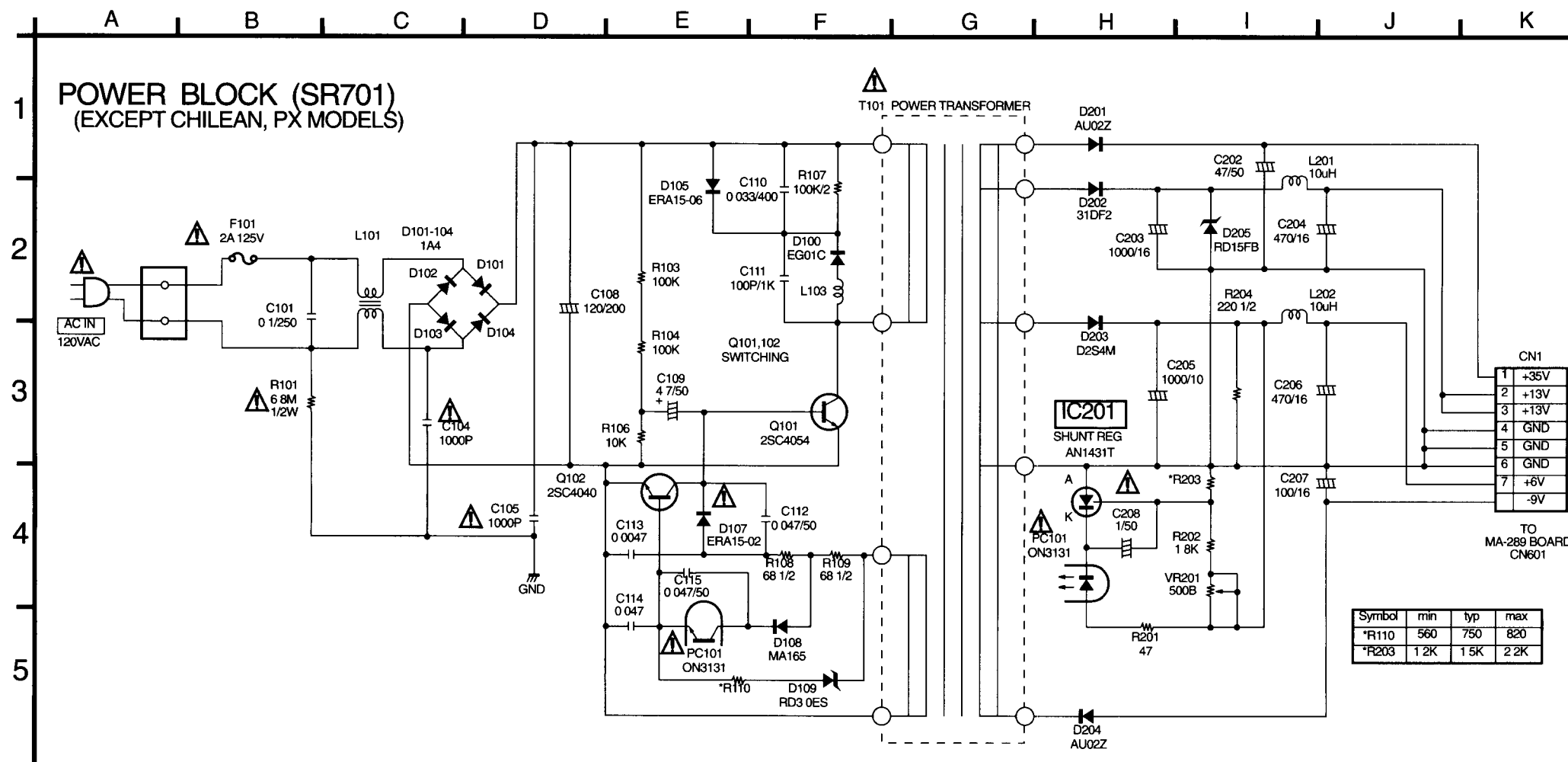
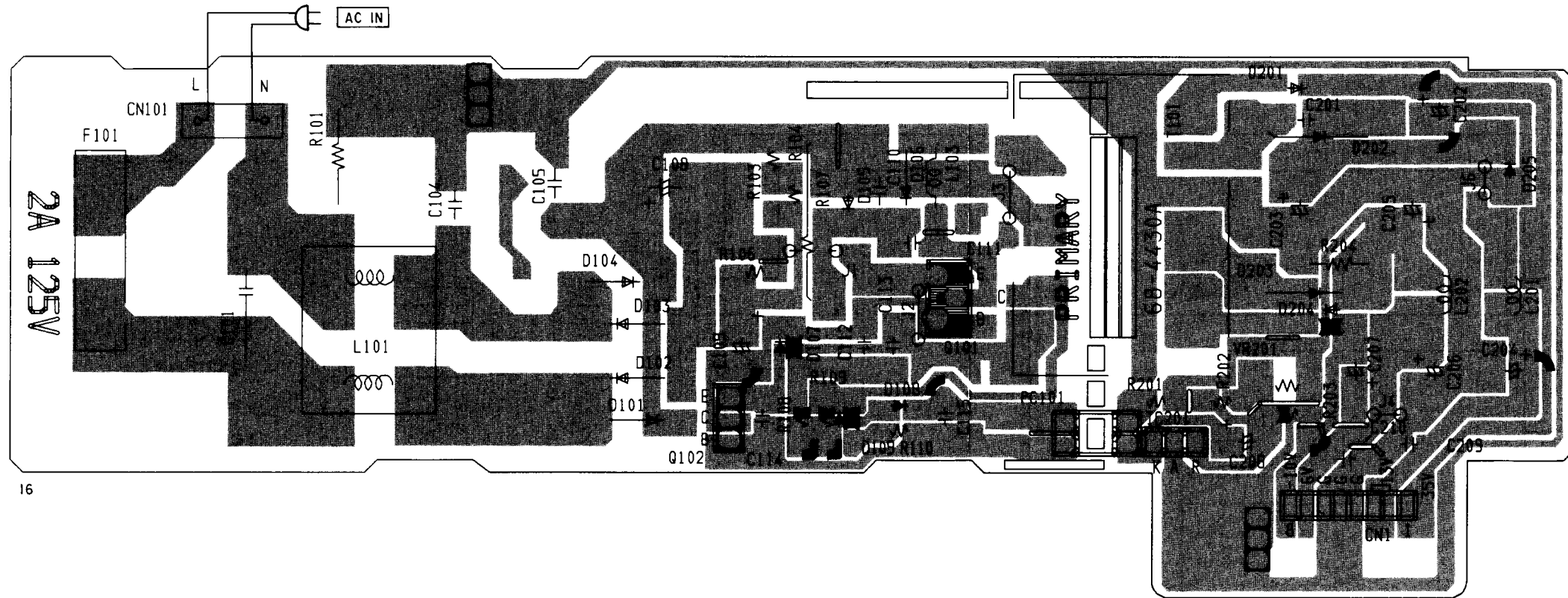
• See page 4-6 for MA-289 printed wiring board



## POWER BLOCK SR701 (SWITCHING REGULATOR) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No. SR701 Board; 5,000 Series —

POWER BLOCK SR70I (EXCEPT CHILEAN, PX MODELS)



**Note :**  
The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety  
Replace only with part number specified

**Note :**  
Les composants identifiés par une marque  $\Delta$  sont critiques pour la sécurité.  
Ne les remplacer que par une pièce portant le numéro spécifique

| Symbol | min  | typ  | max  |
|--------|------|------|------|
| *R110  | 560  | 750  | 820  |
| *R203  | 1.2K | 1.5K | 2.2K |



## SECTION 5 REPAIR PARTS LIST

### 5-1. EXPLODED VIEWS

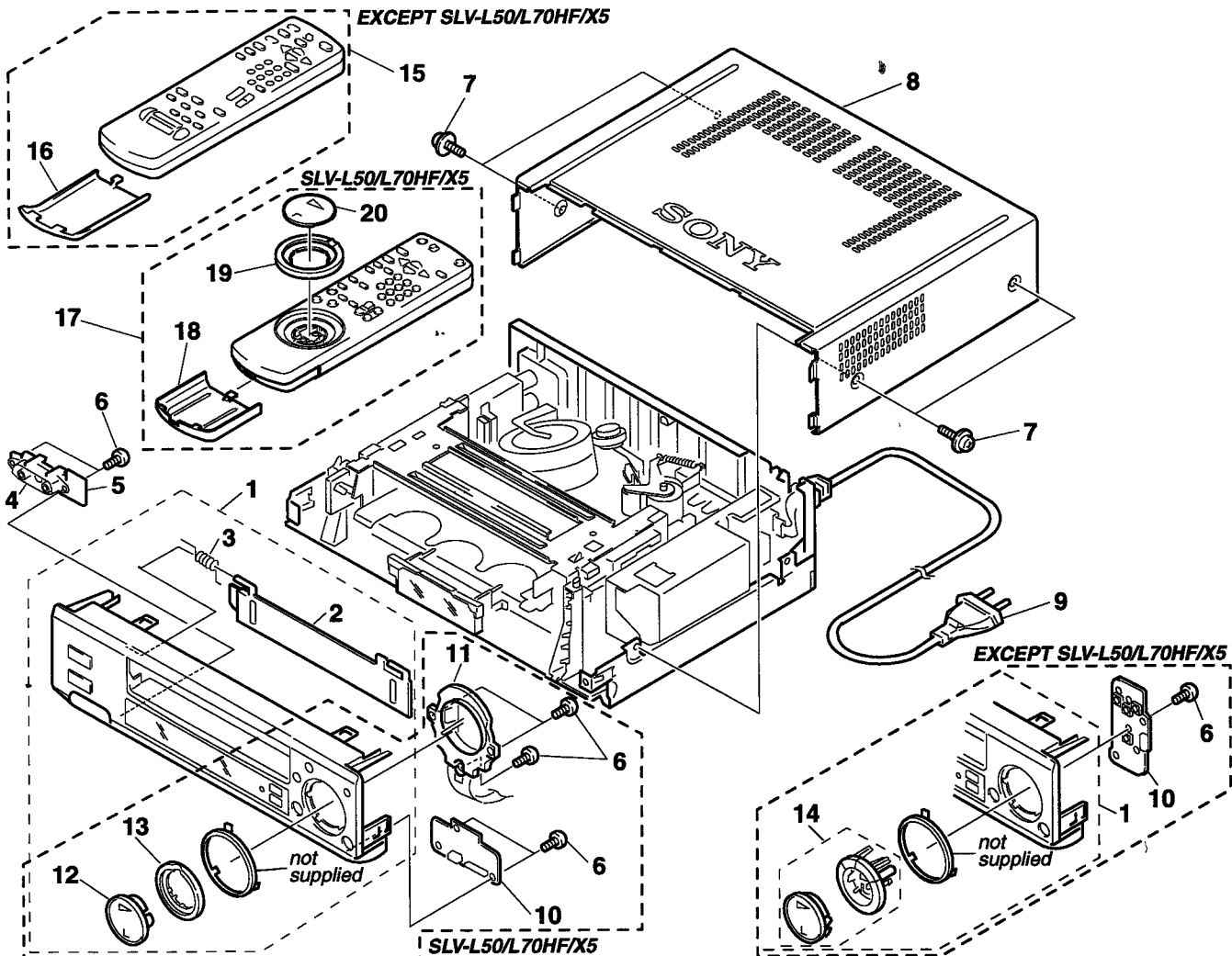
#### NOTE:

- XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (#mark) list is given in the last of this parts list.

The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

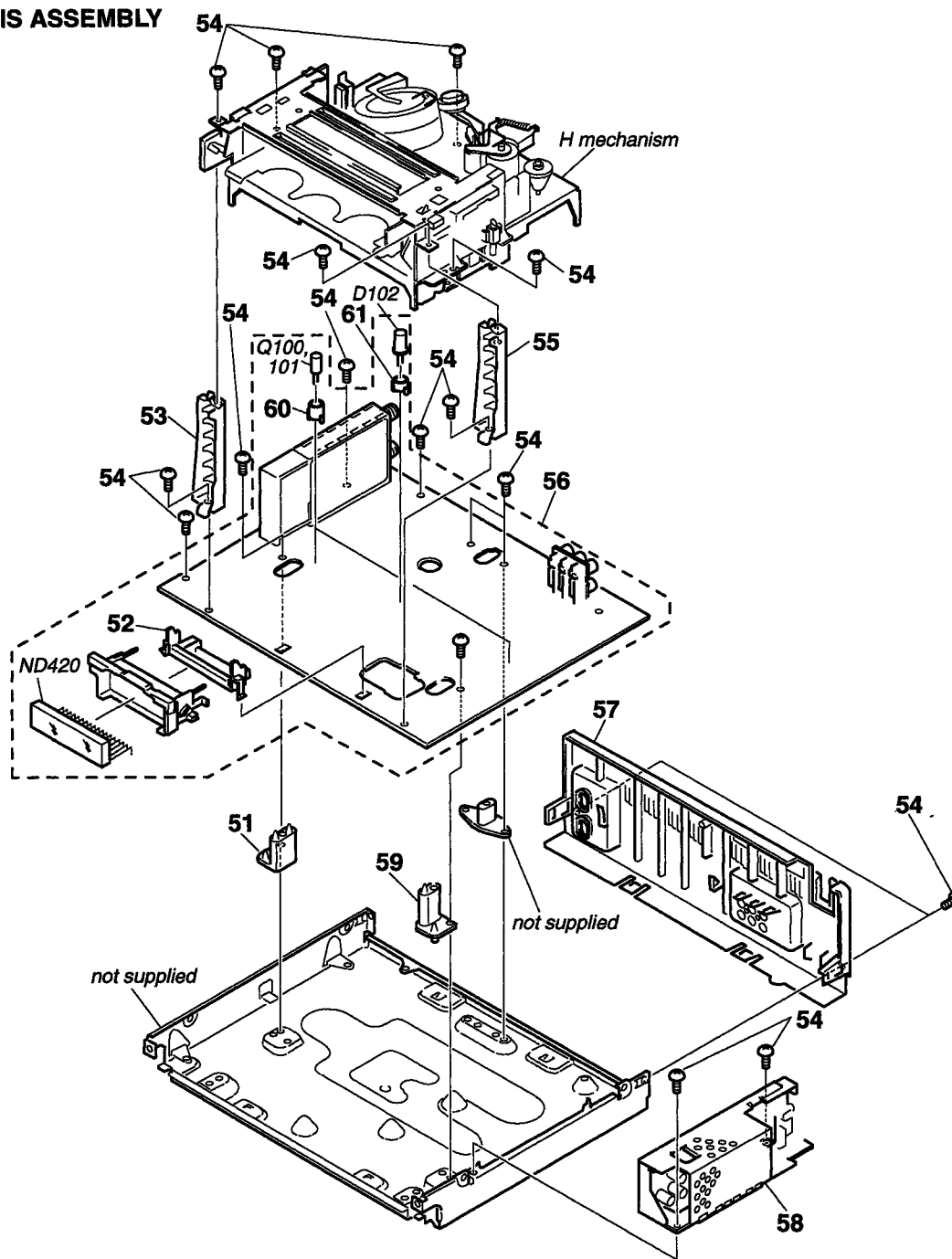
Les composants identifiés par une marque  $\Delta$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

#### 5-1-1. FRONT PANEL ASSEMBLY AND CASE



| Ref. No.   | Part No.     | Description                             | Remarks                             | Ref. No.   | Part No.     | Description                         | Remarks                             |
|------------|--------------|-----------------------------------------|-------------------------------------|------------|--------------|-------------------------------------|-------------------------------------|
| 1          | X-3946-580-1 | PANEL ASSY, FRONT (675HF)               |                                     | $\Delta$ 9 | 1-777-857-21 | CORD, POWER(Chilean, PX)            |                                     |
| 1          | X-3946-596-1 | PANEL ASSY, FRONT (L70HF)               |                                     | * 10       | 1-664-504-11 | DS-75 BOARD                         |                                     |
| 1          | X-3946-748-1 | PANEL ASSY, FRONT (695HF)               |                                     | 11         | 1-762-844-21 | SWITCH, ROTARY (L50, L70HF, X5)     |                                     |
| 1          | X-3946-751-1 | PANEL ASSY, FRONT (495)                 |                                     | 12         | 3-972-782-01 | BUTTON, CENTER (L50, L70HF)         |                                     |
| 1          | X-3946-754-1 | PANEL ASSY, FRONT (L60HF)               |                                     | 12         | 3-972-782-51 | BUTTON, CENTER (X5)                 |                                     |
| 1          | X-3946-756-1 | PANEL ASSY, FRONT (L50)                 |                                     | 13         | 3-972-783-01 | RING, JOG (L50, L70HF, X5)          |                                     |
| 1          | X-3946-758-1 | PANEL ASSY, FRONT (L40)                 |                                     | 14         | X-3946-598-1 | BUTTON ASSY, FUNCTION (676HF, X6HF) |                                     |
| 1          | X-3947-032-1 | PANEL ASSY, FRONT (676HF)               |                                     | 15         | 1-475-026-11 | REMOTE COMMANDER(RMT-V198C)(L40)    |                                     |
| 1          | X-3947-034-1 | PANEL ASSY, FRONT (X5)                  |                                     | 15         | 1-475-027-21 | REMOTE COMMANDER(RMT-V202A)(695HF)  |                                     |
| 1          | X-3947-036-1 | PANEL ASSY, FRONT (X6HF)                |                                     | 15         | 1-475-032-11 | REMOTE COMMANDER(RMT-V203)          | (675HF, 676HF)                      |
| 1          | X-3947-069-1 | PANEL ASSY, FRONT (685HF)               |                                     | 15         | 1-475-032-21 | REMOTE COMMANDER(RMT-V203A)         | (495, 685HF)                        |
| 2          | 3-972-774-01 | DOOR, CASSETTE (EXCEPT 676HF, X5, X6HF) |                                     | 15         | 1-475-032-31 | REMOTE COMMANDER(RMT-V203B)         | (L60HF, X6HF)                       |
| 2          | 3-972-774-21 | DOOR, CASSETTE (676HF, X5, X6HF)        |                                     | 16         | 3-709-128-01 | COVER, BATTERY                      | (EXCEPT 695HF, L40, L50, L70HF, X5) |
| 3          | 3-953-432-01 | SPRING (GE), FL                         |                                     | 16         | 3-709-129-01 | COVER, BATTERY (695HF)              |                                     |
| * 4        | 3-972-521-01 | JACK, COVER (685HF, 695HF, L70HF)       |                                     | 16         | 3-709-133-01 | COVER, BATTERY (L40)                |                                     |
| * 4        | 3-972-521-11 | JACK, COVER (495, L50, X5)              |                                     | 17         | 1-475-031-21 | REMOTE COMMANDER (RMT-V201A)        | (L50, L70HF, X5)                    |
| * 5        | 1-664-505-11 | JK-151 BOARD                            | (495, 685HF, 695HF, L50, L70HF, X5) | 18         | 3-709-126-01 | COVER, BATTERY (L50, L70HF, X5)     |                                     |
| 6          | 4-921-277-41 | SCREW (B2 6X8), TAPPING, BIND           |                                     | 19         | 3-972-783-21 | RING, JOG (L50, L70HF, X5)          |                                     |
| 7          | 3-710-901-11 | SCREW, TAPPING                          |                                     | 20         | 3-972-850-01 | BUTTON, FUNCTION (L50, L70HF, X5)   |                                     |
| * 8        | 3-972-502-01 | CASE, UPPER BA (EXCEPT 676HF, X5, X6HF) |                                     |            |              |                                     |                                     |
| * 8        | 3-972-502-31 | CASE, UPPER BA (676HF, X5, X6HF)        |                                     |            |              |                                     |                                     |
| $\Delta$ 9 | 1-777-851-21 | CORD, POWER(US, Canadian)               |                                     |            |              |                                     |                                     |
| $\Delta$ 9 | 1-777-854-21 | CORD, POWER(Mexican, Panamanian)        |                                     |            |              |                                     |                                     |

## 5-1-2. CHASSIS ASSEMBLY

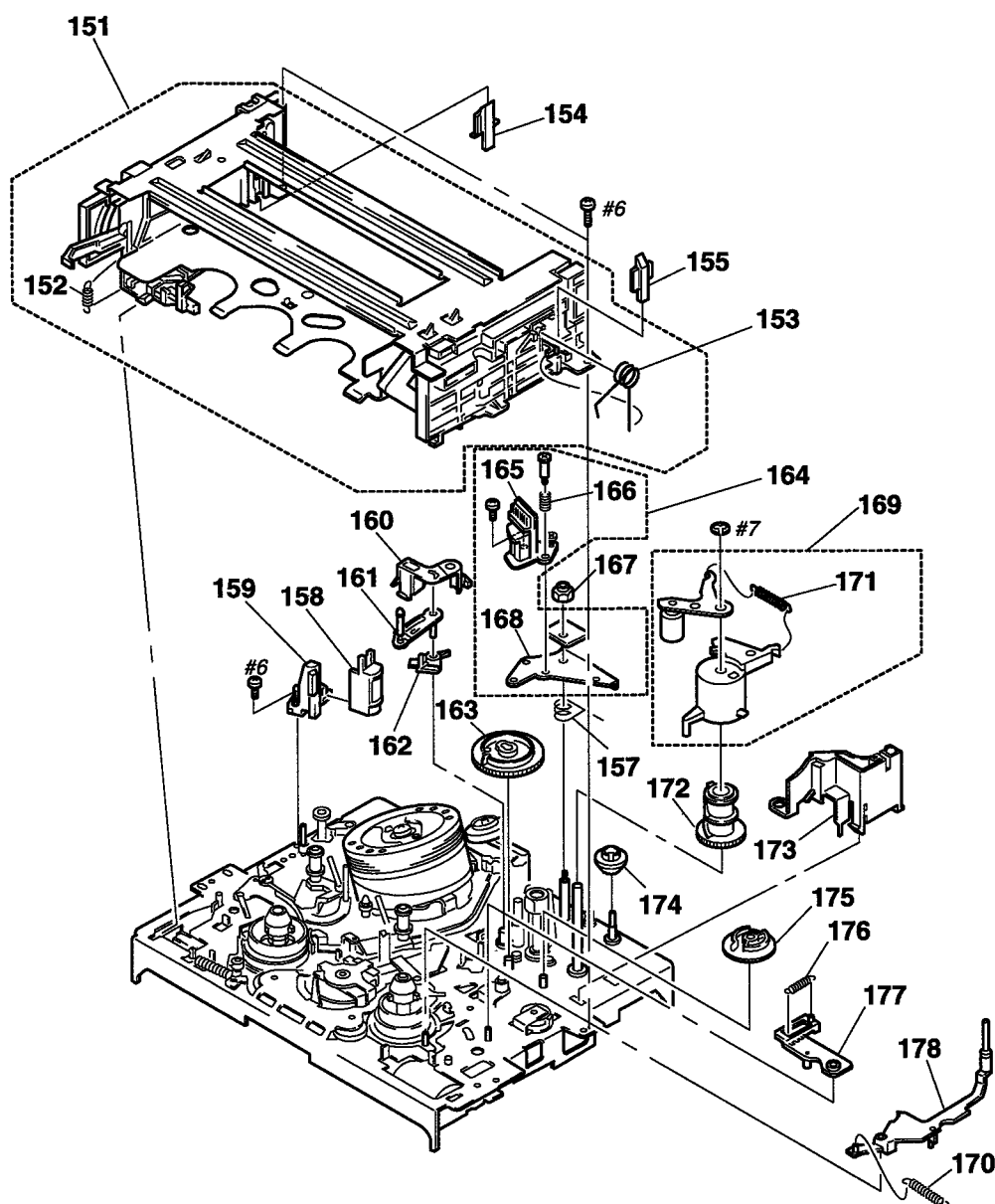


| Ref. No. | Part No.     | Description                                            | Remarks | Ref. No. | Part No.     | Description                           | Remarks |
|----------|--------------|--------------------------------------------------------|---------|----------|--------------|---------------------------------------|---------|
| * 51     | 3-959-381-01 | BASE (L), MD                                           |         | * 57     | 3-972-504-11 | PANEL, REAR (L40)                     |         |
| * 52     | 3-966-865-01 | BASE, INDICATION TUBE                                  |         | * 57     | 3-972-504-21 | PANEL, REAR (L50, X5HF)               |         |
| * 53     | 3-959-388-01 | BASE (L), FL                                           |         | * 57     | 3-972-504-31 | PANEL, REAR (L70HF)                   |         |
| 54       | 3-970-608-21 | SUMITITE (B3), +BV                                     |         | * 57     | 3-972-504-41 | PANEL, REAR (L60HF, X6HF)             |         |
| * 55     | 3-959-389-01 | BASE (R), FL                                           |         | * 57     | 3-972-504-71 | PANEL, REAR (685HF, 695HF)            |         |
| * 56     | A-6791-105-A | MA-289B COMPLETE PCB BOARD, COMPLETE<br>(675HF, 676HF) |         | * 57     | 3-972-504-81 | PANEL, REAR (495)                     |         |
| * 56     | A-6791-110-A | MA-289A COMPLETE PCB BOARD, COMPLETE<br>(685HF, 695HF) |         | △ 58     | 1-468-168-11 | POWER BLOCK SR701(EXCEPT Chilean, PX) |         |
| * 56     | A-6791-124-A | MA-289C COMPLETE PCB BOARD, COMPLETE<br>(495)          |         | △ 58     | 1-468-169-11 | POWER BLOCK HS-821SF (Chilean, PX)    |         |
| * 56     | A-6791-125-A | MA-289D COMPLETE PCB BOARD, COMPLETE<br>(L70HF)        |         | * 59     | 3-959-383-01 | BASE (R), MD                          |         |
| * 56     | A-6791-126-A | MA-289E COMPLETE PCB BOARD, COMPLETE<br>(L60HF, X6HF)  |         | * 60     | 3-960-273-01 | SPACER, TOP END                       |         |
| * 56     | A-6791-127-A | MA-289F COMPLETE PCB BOARD, COMPLETE<br>(L50, X5)      |         | * 61     | 3-960-274-01 | SPACER, LED                           |         |
| * 56     | A-6791-128-A | MA-289G COMPLETE PCB BOARD, COMPLETE<br>(L40)          |         | D102     | 8-719-048-26 | DIODE GL528V1                         |         |
| * 57     | 3-972-504-01 | PANEL, REAR (675HF, 676HF)                             |         | ND420    | 1-517-595-11 | TUBE, FLUORESCENT INDICATOR           |         |
|          |              |                                                        |         | Q100     | 8-729-025-92 | PHOTO TRANSISTOR PT380F               |         |
|          |              |                                                        |         | Q101     | 8-729-025-92 | PHOTO TRANSISTOR PT380F               |         |

**Note :**  
The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

**Note :**  
Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

### 5-1-3. MECHANISM DECK ASSEMBLY-1



| Ref. No. | Part No.     | Description                    | Remarks | Ref. No. | Part No.     | Description                    | Remarks |
|----------|--------------|--------------------------------|---------|----------|--------------|--------------------------------|---------|
| 151      | A-6759-603-A | FL BLOCK ASSY                  |         | 165      | 1-506-485-11 | PIN, CONNECTOR 6P              |         |
| 152      | 3-958-467-01 | SPRING, TENSION COIL           |         | 166      | 3-960-439-02 | SPRING (ACE), COMPRESSION      |         |
| 153      | 3-970-471-01 | SPRING, TORSION                |         | 167      | 3-942-867-01 | NUT, ACE HEIGHT ADJUSTMENT     |         |
| 154      | 3-958-488-03 | PLATE, LIGHT GUIDE, END SENSOR |         | 168      | 3-958-491-01 | BASE, ACE                      |         |
| 155      | 3-970-473-01 | PLATE, LIGHT GUIDE, TOP SENSOR |         | 169      | A-6746-072-A | PRESS BLOCK ASSY, PINCH        |         |
|          |              |                                |         | 170      | 3-958-505-01 | SPRING (SOFT BRAKE T), TENSION |         |
| 157      | 3-958-487-01 | SPRING, (ACE) TORSION COIL     |         | 171      | 3-958-455-01 | SPRING (PINCH), TENSION        |         |
| 158      | 1-500-144-11 | HEAD, FE                       |         | 172      | 3-958-151-01 | GEAR, ELEVATOR                 |         |
| 159      | X-3945-348-2 | FEH ASSY                       |         | 173      | 3-958-454-01 | OPNER, LID                     |         |
| 160      | 3-962-298-01 | BRACKET, TG7 TAPE              |         | 174      | 3-958-501-01 | SCREW, ACE ADJUSTMENT          |         |
| 161      | X-3944-797-1 | TG8 ASSY                       |         | 175      | 3-958-153-01 | GEAR, PRESS                    |         |
| 162      | 3-958-421-01 | HOLDER, TG8                    |         | 176      | 3-958-462-01 | SPRING (RVS BRAKE), TENSION    |         |
| 163      | 3-958-152-01 | GEAR, TG8                      |         | 177      | X-3943-885-1 | ARM ASSY, RVS BRAKE            |         |
| 164      | A-6736-103-A | ACE BLOCK ASSY                 |         | 178      | X-3943-882-1 | BRAKE (T) ASSY, SOFT           |         |

## 5-1-4. MECHANISM DECK ASSEMBLY-2

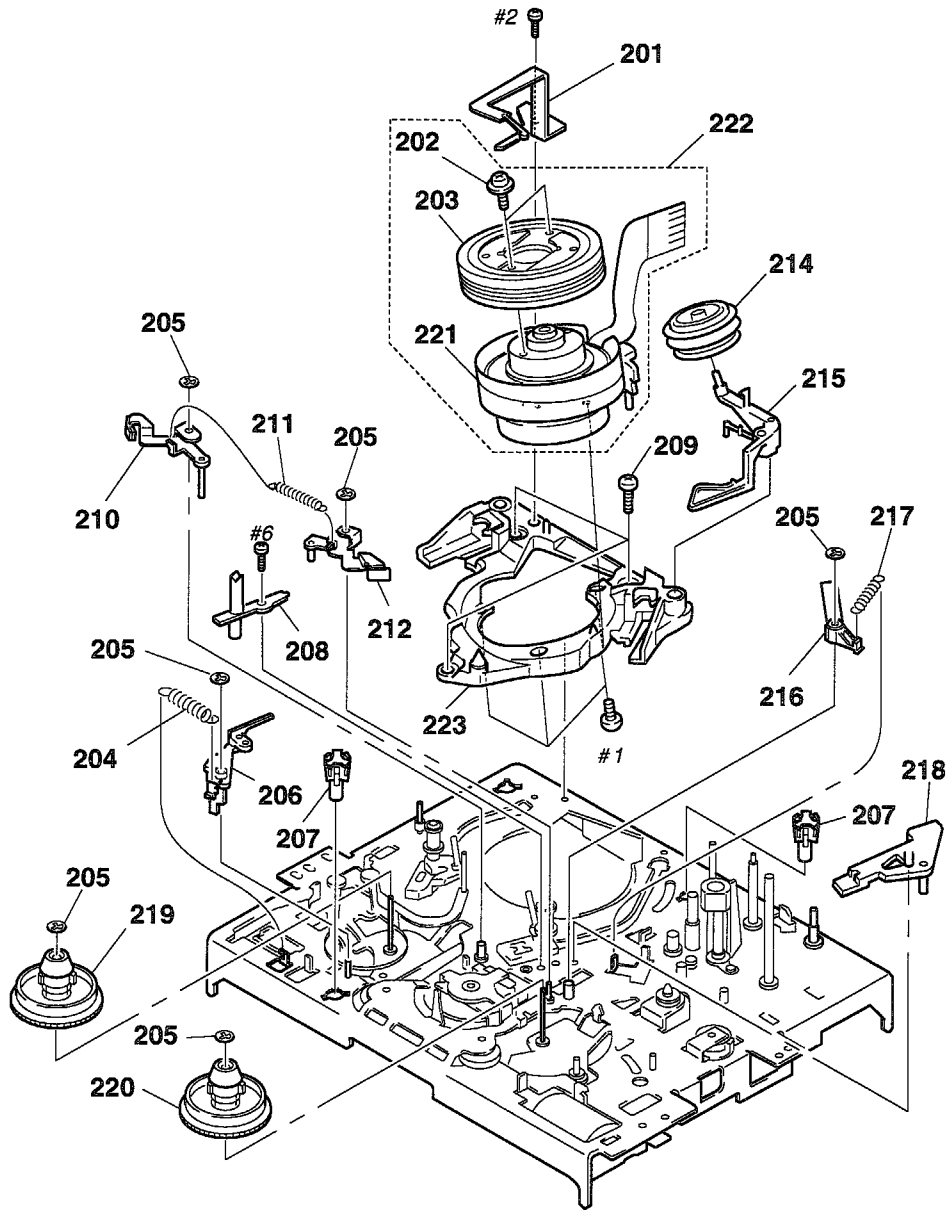
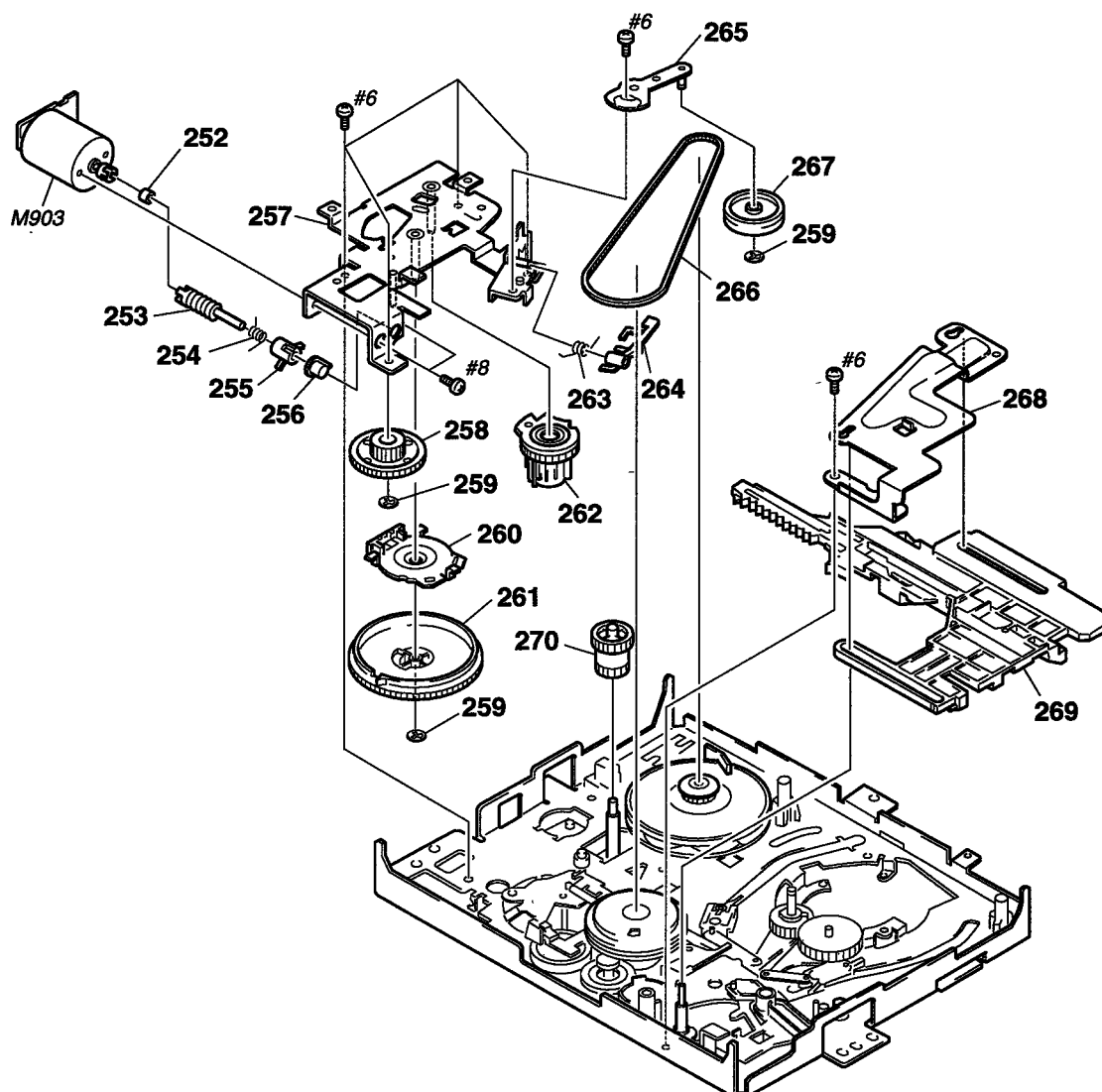


Illustration 675HF/676HF/685HF/695HF/L60HF/L70HF/X6HF

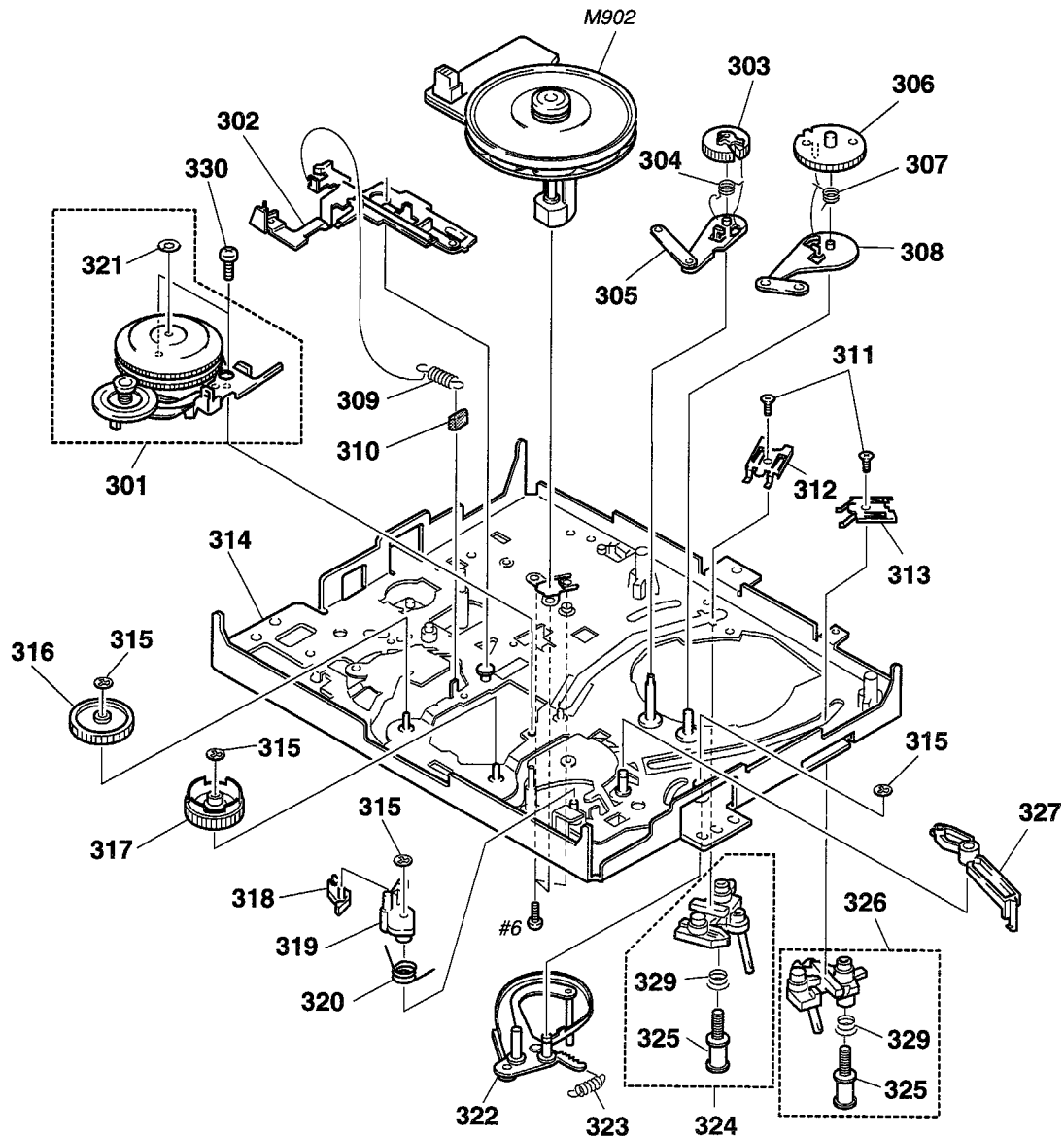
| Ref. No. | Part No      | Description                                                                       | Remarks | Ref. No. | Part No      | Description                                                                           | Remarks |
|----------|--------------|-----------------------------------------------------------------------------------|---------|----------|--------------|---------------------------------------------------------------------------------------|---------|
| 201      | X-3943-899-8 | GROUND ASSY, SHAFT(EXCEPT L2)                                                     |         | 212      | X-3945-444-1 | ARM (T) ASSY, MAIN BRAKE                                                              |         |
| 202      | 2-643-205-01 | SCREW                                                                             |         | 214      | X-3947-255-1 | ROLLER ASSY, HC                                                                       |         |
| 203      | 8-848-576-02 | UPPER DRUM ASSY DZR-45-R (M901)<br>(675HF/676HF/685HF/695HF/L60HF/L70HF/<br>X6HF) |         | 215      | 3-975-724-01 | ARM, HC                                                                               |         |
| 204      | 3-958-443-01 | SPRING, STRETCH COIL SPRING                                                       |         | 216      | 3-960-139-01 | ARM, NEUTRALITY                                                                       |         |
| 205      | 3-669-595-00 | WASHER (2), STOPPER                                                               |         | 217      | 3-958-535-01 | SPRING, TENSION                                                                       |         |
| 206      | 3-958-450-01 | BRAKE (S), SOFT                                                                   |         | 218      | 3-960-138-01 | ARM, PENDULUM COMPULSION                                                              |         |
| 207      | 3-958-390-01 | SHAFT, PC BOARD                                                                   |         | 219      | X-3943-902-1 | TABLE, REEL (S) ASSY                                                                  |         |
| 208      | 3-958-391-01 | PLATE, LIGHT GUIDE, LED                                                           |         | 220      | X-3943-903-1 | TABLE, REEL (T) ASSY                                                                  |         |
| 209      | 3-961-441-01 | SCREW (3x8)                                                                       |         | 221      | 8-848-666-11 | LOWER DRUM ASSY DZL-51B/J-RP (M901)<br>(675HF/676HF/685HF/695HF/L60HF/L70HF/<br>X6HF) |         |
| 210      | X-3945-443-1 | BRAKE (S) ASSY, MAIN                                                              |         | 222      | 8-848-681-11 | DRUM ASSY DZH-73B/Q-RP (M901)<br>(495/L40/L50/X)                                      |         |
| 211      | 3-958-517-01 | SPRING, TENSION COIL                                                              |         | 223      | 3-969-629-01 | DRUM BASE                                                                             |         |

## 5-1-5. MECHANISM DECK ASSEMBLY-3



| Ref. No. | Part No.     | Description             | Remarks | Ref. No. | Part No.     | Description                      | Remarks |
|----------|--------------|-------------------------|---------|----------|--------------|----------------------------------|---------|
| 252      | 3-959-840-11 | RUBBER, JOINT           |         | 262      | 3-958-156-03 | GEAR, FL DRIVING                 |         |
| 253      | 3-958-159-01 | WORM                    |         | 263      | 3-958-445-01 | SPRING, TORSION COIL (CAP BRAKE) |         |
| 254      | 3-958-460-01 | SPRING, ONE-WAY         |         | 264      | X-3943-888-1 | BRAKE ASSY, CAP                  |         |
| 255      | 3-958-160-01 | PROPELLOR               |         | 265      | X-3943-889-1 | ARM ASSY, TENSION VEHICLE        |         |
| 256      | 3-958-155-01 | BEARING, CAM MOTOR      |         | 266      | 3-958-361-01 | BELT, TIMING                     |         |
| * 257    | X-3943-884-1 | CHASSIS ASSY, CAM MOTOR |         | 267      | 3-958-448-01 | WHEEL, TENSION                   |         |
| 258      | 3-958-157-02 | WHEEL, WORM             |         | * 268    | 3-959-763-01 | RETAINER                         |         |
| 259      | 3-669-595-00 | WASHER (2), STOPPER     |         | 269      | 3-958-163-04 | SLIDER, MAIN                     |         |
| 260      | 1-762-076-11 | SWITCH, ROTARY          |         | 270      | 3-958-162-02 | GEAR, UPPER/LOWER COMMUNICATION  |         |
| 261      | 3-958-161-07 | GEAR, CAM               |         | M903     | X-3943-883-1 | MOTOR ASSY, CAM                  |         |

## 5-1-6. MECHANISM DECK ASSEMBLY-4



| Ref. No. | Part No      | Description               | Remarks | Ref. No. | Part No      | Description                  | Remarks |
|----------|--------------|---------------------------|---------|----------|--------------|------------------------------|---------|
| 301      | A-6739-102-A | RKB BLOCK ASSY            |         | 316      | 3-962-960-01 | GEAR (T-K), IDLER            |         |
| 302      | X-3943-897-1 | LEVER ASSY, TRIGGER       |         | 317      | 3-962-959-01 | GEAR (S-K), IDLER            |         |
| 303      | 3-958-485-02 | GEAR (T), LOADING         |         | 318      | 3-958-533-01 | CLAW, S WINDING              |         |
| 304      | 3-960-449-01 | SPRING (T), TORSION COIL  |         | 319      | 3-958-532-01 | ARM, S WINDING               |         |
| 305      | X-3943-891-3 | LEVER (T) ASSY, LOADING   |         | 320      | 3-958-534-01 | SPRING, TORSION              |         |
| 306      | 3-958-476-01 | GEAR (S), LOADING         |         | 321      | 3-966-092-01 | RING, RETAINING, SLIT WASHER |         |
| 307      | 3-960-448-01 | SPRING (S), TORSION COIL  |         | 322      | X-3943-886-1 | TG1 ASSY                     |         |
| 308      | X-3943-890-2 | LEVER (S) ASSY, LOADING   |         | 323      | 3-958-492-01 | SPRING (TG1), TENSION COIL   |         |
| 309      | 3-958-529-01 | SPRING (MOMENT), TENSION  |         | 324      | A-6750-325-A | T BLOCK ASSY, SHUTTLE        |         |
| 310      | 3-959-840-11 | RUBBER, JOINT             |         | 325      | X-3944-378-1 | ROLLER ASSY, GUIDE           |         |
| 311      | 3-960-720-01 | SCREW                     |         | 326      | A-6750-316-A | SHUTTLE (S) BLOCK ASSY       |         |
| 312      | 3-960-688-01 | SPRING, LEAF (T), LOADING |         | 327      | 3-958-504-01 | ARM, FIXED RELEASE           |         |
| 313      | 3-960-687-01 | SPRING, LEAF (S), LOADING |         | 329      | 3-965-178-01 | SPRING                       |         |
| 314      | X-3945-485-4 | CHASSIS ASSY, MECHANICAL  |         | M902     | 1-698-409-14 | MOTOR, DC (CAPSTAN)          |         |
| 315      | 3-669-595-00 | WASHER (2), STOPPER       |         |          |              |                              |         |

## 5-2. ELECTRICAL PARTS LIST

### NOTE:

When indicating parts by reference number, please include the board name.

The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque  $\Delta$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:  
uF:  $\mu$ F

- RESISTORS  
All resistors are in ohms.  
METAL: metal-film resistor  
METAL OXIDE: Metal Oxide-film resistor  
F: nonflammable
- COILS  
uH:  $\mu$ H
- SEMICONDUCTORS  
In each case, u:  $\mu$ , for example:  
uA...:  $\mu$ A..., uPA...,  $\mu$ PA...,  
uPB...,  $\mu$ PB..., uPC...,  $\mu$ PC...,  
uPD...,  $\mu$ PD...

| Ref. No. | Part No.     | Description                                                                       | Remarks | Ref. No. | Part No.     | Description                                    | Remarks |
|----------|--------------|-----------------------------------------------------------------------------------|---------|----------|--------------|------------------------------------------------|---------|
| *        | 1-664-504-11 | DS-75 BOARD (Ref.No.:1,000 Series)<br>*****                                       |         |          |              | < JACK >                                       |         |
|          |              | < CONNECTOR >                                                                     |         | CJ801    | 1-774-509-11 | JACK, PIN 3P(LINE IN 2) (685HF,695HF,L70HF)    |         |
| CN442    | 1-774-471-41 | CONNECTOR, FFC/FPC 5P (L50,L70HF,X5)                                              |         | CJ801    | 1-774-510-11 | JACK, PIN 2P(LINE IN 2)(495,L50,X5)            |         |
|          |              | < DIODE >                                                                         |         |          |              | < CONNECTOR >                                  |         |
| D441     | 8-719-056-06 | DIODE SLR-342DC3F (L50,L70HF,X5)                                                  |         | CN801    | 1-506-483-21 | PIN, CONNECTOR 4P (495,L50,X5)                 |         |
|          |              | < JUMPER RESISTOR >                                                               |         | CN801    | 1-506-484-11 | PIN, CONNECTOR 5P (685H,695HF,L70HF)           |         |
| JR700    | 1-216-296-91 | CONDUCTOR, CHIP (3216)                                                            |         |          |              | < DIODE >                                      |         |
| JR701    | 1-216-295-91 | CONDUCTOR, CHIP (2012)                                                            |         | D802     | 8-719-108-12 | DIODE RD9.1E-W (685HF,695HF,L70HF)             |         |
| JR702    | 1-216-296-91 | CONDUCTOR, CHIP (3216)                                                            |         | D801     | 8-719-108-12 | DIODE RD9.1E-W                                 |         |
| JR703    | 1-216-296-91 | CONDUCTOR, CHIP (3216)                                                            |         | D803     | 8-719-109-84 | DIODE RD5.1ESB2                                |         |
| JR704    | 1-216-296-91 | CONDUCTOR, CHIP (3216)                                                            |         | D804     | 8-719-108-12 | DIODE RD9 1E-W                                 |         |
|          |              | < RESISTOR >                                                                      |         |          |              | < JUMPER RESISTOR >                            |         |
| JR705    | 1-216-296-91 | CONDUCTOR, CHIP (3216)                                                            |         | JS801    | 1-216-295-91 | CONDUCTOR, CHIP (2012) (495,L50,X5)            |         |
| JR706    | 1-216-296-91 | CONDUCTOR, CHIP (3216)                                                            |         |          |              | < RESISTOR >                                   |         |
| JR707    | 1-216-295-91 | CONDUCTOR, CHIP (2012)                                                            |         | R801     | 1-216-295-91 | CONDUCTOR, CHIP(2012)                          |         |
| R451     | 1-216-053-00 | METAL CHIP 1.5K 5% 1/10W                                                          |         | R802     | 1-216-295-91 | CONDUCTOR, CHIP(2012)(685HF,695HF,L70HF)       |         |
| R452     | 1-216-053-00 | METAL CHIP 1.5K 5% 1/10W                                                          |         | R803     | 1-216-022-00 | METAL CHIP 75 5% 1/10W                         |         |
| R454     | 1-216-041-00 | METAL CHIP 470 5% 1/10W<br>(L50,L70HF,X5)                                         |         |          |              |                                                |         |
|          |              | < SWITCH >                                                                        |         | *        | A-6791-105-A | MA-289B BOARD, COMPLETE (675HF,676HF)<br>***** |         |
| S441     | 1-571-977-11 | SWITCH, TACTIL(FF)<br>(495,675HF,676HF,685HF,695HF,L40,L60HF,X6HF)                |         | *        | A-6791-110-A | MA-289A BOARD, COMPLETE (685HF,695HF)<br>***** |         |
| S442     | 1-571-977-11 | SWITCH, TACTIL(PB)<br>(495,675HF,676HF,685HF,695HF,L40,L60HF,X6HF)                |         | *        | A-6791-124-A | MA-289C BOARD, COMPLETE (495)<br>*****         |         |
| S443     | 1-571-977-11 | SWITCH, TACTIL(STOP)<br>(495,675HF,676HF,685HF,695HF,L40,L60HF,X6HF)              |         | *        | A-6791-125-A | MA-289D BOARD, COMPLETE (L70HF)<br>*****       |         |
| S444     | 1-571-977-11 | SWITCH, TACTIL(REW)<br>(495,675HF,676HF,685HF,695HF,L40,L60HF,X6HF)               |         | *        | A-6791-126-A | MA-289E BOARD, COMPLETE (L60HF,X6HF)<br>*****  |         |
| S445     | 1-571-977-11 | SWITCH, TACTIL (JOG) (L50,L70HF,X5)                                               |         | *        | A-6791-127-A | MA-289F BOARD, COMPLETE (L50, X5)<br>*****     |         |
| S446     | 1-571-977-11 | SWITCH, TACTIL (FF) (L50,L70HF,X5)                                                |         | *        | A-6791-128-A | MA-289G BOARD, COMPLETE (L40)<br>*****         |         |
| S447     | 1-571-977-11 | SWITCH, TACTIL (REW) (L50,L70HF,X5)                                               |         |          |              | (Ref.No.:1,000 Series)                         |         |
| *        | 1-664-505-11 | JK-151 BOARD<br>*****<br>(495,685HF,695HF,L50,L70HF,X5)<br>(Ref.No.:2,000 Series) |         | *        | 3-960-273-01 | SPACER, TOP END                                |         |
|          |              | < CAPACITOR >                                                                     |         | *        | 3-960-274-01 | SPACER, LED                                    |         |
| C803     | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% 50V                                                      |         | *        | 3-966-865-01 | BASE, INDICATION TUBE                          |         |
| C805     | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% 50V<br>(685HF,695HF,L70HF)                               |         |          |              | < BUZZER >                                     |         |
| C806     | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% 50V                                                      |         | BZ160    | 1-529-080-11 | BUZZER, PIEZOELECTRIC                          |         |
|          |              | < CAPACITOR >                                                                     |         |          |              | < CAPACITOR >                                  |         |
| C102     | 1-163-251-11 | CERAMIC CHIP 100PF 5% 50V                                                         |         | C102     | 1-163-251-11 | CERAMIC CHIP 100PF 5% 50V                      |         |
| C103     | 1-163-251-11 | CERAMIC CHIP 100PF 5% 50V                                                         |         | C103     | 1-163-251-11 | CERAMIC CHIP 100PF 5% 50V                      |         |
| C104     | 1-124-261-00 | ELECT 10uF 20% 50V                                                                |         | C104     | 1-124-261-00 | ELECT 10uF 20% 50V                             |         |
| C106     | 1-104-760-11 | CERAMIC CHIP 0.047uF 10% 50V                                                      |         | C106     | 1-104-760-11 | CERAMIC CHIP 0.047uF 10% 50V                   |         |
| C111     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                                                           |         | C111     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                        |         |

| Ref No | Part No      | Description  | Remarks           | Ref. No. | Part No.     | Description  | Remarks           |
|--------|--------------|--------------|-------------------|----------|--------------|--------------|-------------------|
| C112   | 1-163-031-11 | CERAMIC CHIP | 0.01uF 50V        | C239     | 1-124-589-11 | ELECT        | 47uF 20% 16V      |
| C113   | 1-163-031-11 | CERAMIC CHIP | 0.01uF 50V        | C240     | 1-126-160-11 | ELECT        | 1uF 20% 50V       |
| C114   | 1-163-031-11 | CERAMIC CHIP | 0.01uF 50V        | C241     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   |
| C115   | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         | C242     | 1-126-160-11 | ELECT        | 1uF 20% 50V       |
| C118   | 1-124-589-11 | ELECT        | 47uF 20% 16V      | C243     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 50V        |
| C119   | 1-124-589-11 | ELECT        | 47uF 20% 16V      | C244     | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V     |
| C120   | 1-163-031-11 | CERAMIC CHIP | 0.01uF 50V        | C245     | 1-163-809-11 | CERAMIC CHIP | 0.047uF 10% 25V   |
| C131   | 1-163-031-11 | CERAMIC CHIP | 0.01uF 50V        | C246     | 1-126-160-11 | ELECT        | 1uF 20% 50V       |
| C132   | 1-124-589-11 | ELECT        | 47uF 20% 16V      | C247     | 1-163-809-11 | CERAMIC CHIP | 0.047uF 10% 25V   |
| C134   | 1-163-031-11 | CERAMIC CHIP | 0.01uF 50V        | C248     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 50V        |
| C140   | 1-164-161-11 | CERAMIC CHIP | 0.0022uF 10% 100V | C249     | 1-124-589-11 | ELECT        | 47uF 20% 16V      |
| C141   | 1-124-234-00 | ELECT        | 22uF 20% 16V      | C250     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         |
| C142   | 1-124-234-00 | ELECT        | 22uF 20% 16V      | C251     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         |
| C144   | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V      | C252     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 50V        |
| C146   | 1-124-234-00 | ELECT        | 22uF 20% 16V      | C253     | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V     |
| C147   | 1-124-584-00 | ELECT        | 100uF 20% 10V     | C254     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         |
| C148   | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         | C255     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         |
| C160   | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         | C256     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         |
| C161   | 1-124-584-00 | ELECT        | 100uF 20% 10V     | C260     | 1-163-229-11 | CERAMIC CHIP | 12PF 5% 50V       |
| C162   | 1-104-905-11 | CAPACITOR    | 0.22F 5.5V        | C261     | 1-163-229-11 | CERAMIC CHIP | 12PF 5% 50V       |
| C163   | 1-163-227-11 | CERAMIC CHIP | 10PF 0.5PF 50V    | C264     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   |
| C164   | 1-163-227-11 | CERAMIC CHIP | 10PF 0.5PF 50V    | C265     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   |
| C165   | 1-163-099-00 | CERAMIC CHIP | 18PF 5% 50V       | C266     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 50V        |
| C166   | 1-163-099-00 | CERAMIC CHIP | 18PF 5% 50V       | C267     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   |
| C167   | 1-163-125-00 | CERAMIC CHIP | 220PF 5% 50V      | C268     | 1-163-241-11 | CERAMIC CHIP | 39PF 5% 50V       |
| C168   | 1-124-261-00 | ELECT        | 10uF 20% 50V      | C269     | 1-163-241-11 | CERAMIC CHIP | 39PF 5% 50V       |
| C170   | 1-124-234-00 | ELECT        | 22uF 20% 16V      | C270     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   |
| C171   | 1-163-019-00 | CERAMIC CHIP | 0.0068uF 10% 50V  | C271     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   |
| C172   | 1-163-125-00 | CERAMIC CHIP | 220PF 5% 50V      | C272     | 1-163-241-11 | CERAMIC CHIP | 39PF 5% 50V       |
| C201   | 1-126-160-11 | ELECT        | 1uF 20% 50V       | C273     | 1-163-241-11 | CERAMIC CHIP | 39PF 5% 50V       |
| C202   | 1-163-809-11 | CERAMIC CHIP | 0.047uF 10% 25V   | C274     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   |
| C204   | 1-163-031-11 | CERAMIC CHIP | 0.01uF 50V        | C276     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   |
| C205   | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   | C277     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   |
| C206   | 1-164-232-11 | CERAMIC CHIP | 0.01uF 50V        | C278     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   |
| C207   | 1-164-232-11 | CERAMIC CHIP | 0.01uF 50V        | C279     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V   |
| C208   | 1-163-241-11 | CERAMIC CHIP | 39PF 5% 50V       | C280     | 1-124-584-00 | ELECT        | 100uF 20% 10V     |
| C209   | 1-124-234-00 | ELECT        | 22uF 20% 16V      | C281     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         |
| C210   | 1-163-131-00 | CERAMIC CHIP | 390PF 5% 50V      | C282     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 50V        |
| C211   | 1-163-239-11 | CERAMIC CHIP | 33PF 5% 50V       | C283     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         |
| C213   | 1-163-257-11 | CERAMIC CHIP | 180PF 5% 50V      | C284     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         |
| C214   | 1-163-235-11 | CERAMIC CHIP | 22PF 5% 50V       | C286     | 1-124-584-00 | ELECT        | 100uF 20% 10V     |
| C217   | 1-126-160-11 | ELECT        | 1uF 20% 50V       | C287     | 1-163-227-11 | CERAMIC CHIP | 10PF 0.5PF 50V    |
| C219   | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         | C288     | 1-163-227-11 | CERAMIC CHIP | 10PF 0.5PF 50V    |
| C220   | 1-126-160-11 | ELECT        | 1uF 20% 50V       | C289     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         |
| C222   | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         | C301     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         |
| C223   | 1-124-589-11 | ELECT        | 47uF 20% 16V      | C302     | 1-124-589-11 | ELECT        | 47uF 20% 16V      |
| C224   | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         | C303     | 1-126-160-11 | ELECT        | 1uF 20% 50V       |
| C226   | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         | C304     | 1-126-160-11 | ELECT        | 1uF 20% 50V       |
| C227   | 1-163-091-00 | CERAMIC CHIP | 8PF 50V           | C305     | 1-126-160-11 | ELECT        | 1uF 20% 50V       |
| C228   | 1-124-261-00 | ELECT        | 10uF 20% 50V      | C306     | 1-126-160-11 | ELECT        | 1uF 20% 50V       |
| C229   | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         | C307     | 1-124-261-00 | ELECT        | 10uF 20% 50V      |
| C230   | 1-124-589-11 | ELECT        | 47uF 20% 16V      | C308     | 1-124-589-11 | ELECT        | 47uF 20% 16V      |
| C231   | 1-124-261-00 | ELECT        | 10uF 20% 50V      | C309     | 1-126-963-11 | ELECT        | 4.7uF 20% 50V     |
| C232   | 1-126-160-11 | ELECT        | 1uF 20% 50V       | C310     | 1-163-009-11 | CERAMIC CHIP | 0.001uF 10% 50V   |
| C233   | 1-126-160-11 | ELECT        | 1uF 20% 50V       | C311     | 1-164-161-11 | CERAMIC CHIP | 0.0022uF 10% 100V |
| C234   | 1-164-232-11 | CERAMIC CHIP | 0.01uF 50V        | C312     | 1-137-370-11 | FILM         | 0.01uF 5% 50V     |
| C235   | 1-164-232-11 | CERAMIC CHIP | 0.01uF 50V        | C313     | 1-126-964-11 | ELECT        | 10uF 20% 50V      |
| C236   | 1-126-160-11 | ELECT        | 1uF 20% 50V       | C314     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 50V        |
| C237   | 1-164-232-11 | CERAMIC CHIP | 0.01uF 50V        | C315     | 1-126-160-11 | ELECT        | 1uF 20% 50V       |
| C238   | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V         | C317     | 1-126-963-11 | ELECT        | 4.7uF 20% 50V     |

| Ref. No. | Part No.     | Description                               | Remarks | Ref. No. | Part No.     | Description                               | Remarks |
|----------|--------------|-------------------------------------------|---------|----------|--------------|-------------------------------------------|---------|
| C318     | 1-126-967-11 | ELECT 47uF 20% 16V                        |         | C379     | 1-124-257-00 | ELECT 2.2uF 20% 50V                       |         |
| C321     | 1-124-589-11 | ELECT 47uF 20% 16V                        |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| C322     | 1-164-232-11 | CERAMIC CHIP 0.01uF 50V                   |         | C380     | 1-124-261-00 | ELECT 10uF 20% 50V                        |         |
| C323     | 1-164-232-11 | CERAMIC CHIP 0.01uF 50V                   |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| C324     | 1-104-697-11 | FILM 0.047uF 5% 100V                      |         | C381     | 1-126-967-11 | ELECT 47uF 20% 50V                        |         |
|          |              |                                           |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| C341     | 1-124-584-00 | ELECT 100uF 20% 10V                       |         | C382     | 1-137-437-11 | FILM 0.0056uF 5% 50V                      |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| C342     | 1-164-232-11 | CERAMIC CHIP 0.01uF 50V                   |         | C383     | 1-137-378-11 | FILM 0.22uF 5% 50V                        |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| C343     | 1-124-257-00 | ELECT 2.2uF 20% 50V                       |         |          |              |                                           |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C384     | 1-163-037-11 | CERAMIC CHIP 0.022uF 10% 25V              |         |
| C344     | 1-164-232-11 | CERAMIC CHIP 0.01uF 50V                   |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C385     | 1-124-589-11 | ELECT 47uF 20% 16V                        |         |
| C345     | 1-126-160-11 | ELECT 1uF 20% 50V                         |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C386     | 1-163-037-11 | CERAMIC CHIP 0.022uF 10% 25V              |         |
|          |              |                                           |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| C346     | 1-164-232-11 | CERAMIC CHIP 0.01uF 50V                   |         | C387     | 1-124-589-11 | ELECT 47uF 20% 16V                        |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| C347     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                   |         | C388     | 1-124-589-11 | ELECT 47uF 20% 16V                        |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| C350     | 1-164-004-11 | CERAMIC CHIP 0.1uF 10% 25V                |         |          |              |                                           |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C389     | 1-104-760-11 | CERAMIC CHIP 0.047uF 10% 50V              |         |
| C351     | 1-163-135-00 | CERAMIC CHIP 560PF 5% 50V                 |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C390     | 1-164-222-11 | CERAMIC CHIP 0.22uF 25V                   |         |
| C352     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                   |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C391     | 1-163-037-11 | CERAMIC CHIP 0.022uF 10% 25V              |         |
|          |              |                                           |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| C353     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                    |         | C392     | 1-163-037-11 | CERAMIC CHIP 0.022uF 10% 25V              |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| C356     | 1-163-135-00 | CERAMIC CHIP 560PF 5% 50V                 |         | C405     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                   |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |          |              |                                           |         |
| C357     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                   |         | C406     | 1-104-760-11 | CERAMIC CHIP 0.047uF 10% 50V              |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C407     | 1-104-760-11 | CERAMIC CHIP 0.047uF 10% 50V              |         |
| C358     | 1-164-004-11 | CERAMIC CHIP 0.1uF 10% 25V                |         | C421     | 1-124-589-11 | ELECT 47uF 20% 16V                        |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C422     | 1-124-589-11 | ELECT 47uF 20% 16V                        |         |
| C361     | 1-164-222-11 | CERAMIC CHIP 0.22uF 25V                   |         | C423     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                   |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |          |              |                                           |         |
| C362     | 1-164-222-11 | CERAMIC CHIP 0.22uF 25V                   |         | C424     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                    |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C460     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                    |         |
| C363     | 1-126-160-11 | ELECT 1uF 20% 50V                         |         | C461     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                   |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C462     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                   |         |
| C364     | 1-126-160-11 | ELECT 1uF 20% 50V                         |         | C501     | 1-163-099-00 | CERAMIC CHIP 18PF 5% 50V                  |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |          |              |                                           |         |
| C365     | 1-126-160-11 | ELECT 1uF 20% 50V                         |         | C502     | 1-163-237-11 | CERAMIC CHIP 27PF 5% 50V                  |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C503     | 1-163-239-11 | CERAMIC CHIP 33PF 5% 50V                  |         |
| C366     | 1-126-160-11 | ELECT 1uF 20% 50V                         |         | C504     | 1-163-239-11 | CERAMIC CHIP 33PF 5% 50V                  |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C505     | 1-124-589-11 | ELECT 47uF 20% 16V                        |         |
|          |              |                                           |         | C506     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                   |         |
| C369     | 1-124-261-00 | ELECT 10uF 20% 50V                        |         |          |              |                                           |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C507     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                   |         |
| C370     | 1-124-261-00 | ELECT 10uF 20% 50V                        |         | C508     | 1-124-589-11 | ELECT 47uF 20% 16V                        |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C509     | 1-126-160-11 | ELECT 1uF 20% 50V                         |         |
| C371     | 1-124-261-00 | ELECT 10uF 20% 50V                        |         | C510     | 1-163-125-00 | CERAMIC CHIP 220PF 5% 50V                 |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C512     | 1-126-160-11 | ELECT 1uF 20% 50V                         |         |
| C372     | 1-124-261-00 | ELECT 10uF 20% 50V                        |         |          |              |                                           |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C513     | 1-163-227-11 | CERAMIC CHIP 10PF 0.5PF 50V               |         |
| C373     | 1-124-261-00 | ELECT 10uF 20% 50V                        |         | C541     | 1-126-935-11 | ELECT 470uF 20% 6.3V                      |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C542     | 1-124-589-11 | ELECT 47uF 20% 16V                        |         |
|          |              |                                           |         | C543     | 1-124-589-11 | ELECT 47uF 20% 16V                        |         |
| C374     | 1-126-160-11 | ELECT 1uF 20% 50V                         |         | C544     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                   |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |          |              |                                           |         |
| C375     | 1-137-378-11 | FILM 0.22uF 5% 50V                        |         | C570     | 1-124-261-00 | ELECT 10uF 20% 50V                        |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C571     | 1-124-261-00 | ELECT 10uF 20% 50V                        |         |
| C376     | 1-137-437-11 | FILM 0.0056uF 5% 50V                      |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         | C572     | 1-124-261-00 | ELECT 10uF 20% 50V                        |         |
| C377     | 1-126-967-11 | ELECT 47uF 20% 50V                        |         | C573     | 1-124-261-00 | ELECT 10uF 20% 50V                        |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| C378     | 1-124-261-00 | ELECT 10uF 20% 50V                        |         | C574     | 1-163-031-11 | CERAMIC CHIP 0.01uF 50V                   |         |
|          |              | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |          |              |                                           |         |

| Ref. No. | Part No.     | Description                                                             | Remarks                                                   | Ref. No. | Part No.     | Description                                                     | Remarks |
|----------|--------------|-------------------------------------------------------------------------|-----------------------------------------------------------|----------|--------------|-----------------------------------------------------------------|---------|
| C575     | 1-124-589-11 | ELECT                                                                   | 47uF 20% 16V                                              | * CN341  | 1-560-890-00 | PIN, CONNECTOR 2P<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |         |
| C600     | 1-128-131-11 | ELECT                                                                   | 22uF 20% 50V                                              | CN401    | 1-506-469-11 | PIN, CONNECTOR 4P(EXCEPT L50,L70HF,X5)                          |         |
| C602     | 1-124-589-11 | ELECT                                                                   | 47uF 20% 16V                                              | CN401    | 1-506-474-11 | PIN, CONNECTOR 9P(L50,L70HF,X5)                                 |         |
| C604     | 1-163-031-11 | CERAMIC CHIP                                                            | 0.01uF 50V                                                | CN423    | 1-506-469-11 | PIN, CONNECTOR 4P(495,L50,X5)                                   |         |
| C605     | 1-124-589-11 | ELECT                                                                   | 47uF 20% 16V                                              | CN423    | 1-506-470-11 | PIN, CONNECTOR 5P(685HF,695HF,L70HF)                            |         |
| C606     | 1-128-131-11 | ELECT                                                                   | 22uF 20% 50V                                              | CN601    | 1-569-667-11 | CONNECTOR, BOARD TO BOARD 8P                                    |         |
| C608     | 1-124-589-11 | ELECT                                                                   | 47uF 20% 16V                                              |          |              | < DIODE >                                                       |         |
| C701     | 1-124-589-11 | ELECT                                                                   | 47uF 20% 16V                                              | D102     | 8-719-048-26 | DIODE GL528V1                                                   |         |
| C704     | 1-163-031-11 | CERAMIC CHIP                                                            | 0.01uF 50V                                                | D161     | 8-719-200-82 | DIODE 11ES2                                                     |         |
| C706     | 1-126-964-11 | ELECT                                                                   | 10uF 20% 50V                                              | D162     | 8-719-200-82 | DIODE 11ES2                                                     |         |
| C707     | 1-163-009-11 | CERAMIC CHIP                                                            | 0.001uF 10% 50V                                           | D301     | 8-719-911-19 | DIODE 1SS119 (495,L40,L50,X5)                                   |         |
| C708     | 1-124-589-11 | ELECT                                                                   | 47uF 20% 16V                                              | D302     | 8-719-911-19 | DIODE 1SS119 (495,L40,L50,X5)                                   |         |
| C709     | 1-163-031-11 | CERAMIC CHIP                                                            | 0.01uF 50V                                                | D361     | 8-719-911-19 | DIODE 1SS119<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)       |         |
| C710     | 1-163-031-11 | CERAMIC CHIP                                                            | 0.01uF 50V                                                | D401     | 8-719-054-09 | DIODE MPG5304S                                                  |         |
| C711     | 1-163-024-00 | CERAMIC CHIP                                                            | 0.018uF 10% 50V<br>(495,L40,L50,X5)                       | D501     | 8-719-911-19 | DIODE 1SS119                                                    |         |
| C731     | 1-124-261-00 | ELECT                                                                   | 10uF 20% 50V<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) | D540     | 8-719-109-84 | DIODE RD5.1ES-B1                                                |         |
| C732     | 1-124-261-00 | ELECT                                                                   | 10uF 20% 50V<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) | D600     | 8-719-200-82 | DIODE 11ES2                                                     |         |
| C733     | 1-124-261-00 | ELECT                                                                   | 10uF 20% 50V                                              | D601     | 8-719-911-19 | DIODE 1SS119                                                    |         |
| C735     | 1-124-261-00 | ELECT                                                                   | 10uF 20% 50V<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) | D602     | 8-719-109-85 | DIODE RD5.1ES-B2                                                |         |
| C736     | 1-124-589-11 | ELECT                                                                   | 47uF 20% 16V<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) | D702     | 8-719-110-78 | DIODE RD33ES-B2                                                 |         |
| C980     | 1-163-038-00 | CERAMIC CHIP                                                            | 0.1uF 25V<br>(495,685HF,695HF)                            | D980     | 8-719-110-08 | DIODE RD8.2ES-B2 (495,685HF,695HF)                              |         |
| C981     | 1-124-589-11 | ELECT                                                                   | 47uF 20% 16V<br>(495,685HF,695HF)                         | D981     | 8-719-110-08 | DIODE RD8.2ES-B2 (495,685HF,695HF)                              |         |
| C982     | 1-163-038-00 | CERAMIC CHIP                                                            | 0.1uF 25V<br>(495,685HF,695HF)                            | D982     | 8-719-911-19 | DIODE 1SS119 (495,685HF,695HF)                                  |         |
| C983     | 1-163-038-00 | CERAMIC CHIP                                                            | 0.1uF 25V<br>(495,685HF,695HF)                            |          |              | < IC >                                                          |         |
| C984     | 1-163-009-11 | CERAMIC CHIP                                                            | 0.001uF 10% 50V<br>(495,685HF,695HF)                      | IC131    | 8-759-353-59 | IC LB1643                                                       |         |
| C985     | 1-163-009-11 | CERAMIC CHIP                                                            | 0.001uF 10% 50V<br>(495,685HF,695HF)                      | IC160    | 8-759-462-97 | IC M37777M7A-VSX8521-2<br>(495,685HF,695HF)                     |         |
| C986     | 1-163-038-00 | CERAMIC CHIP                                                            | 0.1uF 25V<br>(495,685HF,695HF)                            | IC160    | 8-759-462-98 | IC M37776M5A-VSX8513-2<br>(EXCEPT 495,685HF,695HF)              |         |
|          |              | < JACK >                                                                |                                                           | IC201    | 8-759-439-49 | IC LA71530M                                                     |         |
| CJ540    | 1-779-010-11 | JACK, PIN 4P (LINE IN/OUT)(495,L40)                                     |                                                           | IC202    | 8-759-439-51 | IC LC89978M-TE-L                                                |         |
| CJ540    | 1-779-011-11 | JACK, PIN 6P (LINE IN/OUT)<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |                                                           | IC260    | 8-759-352-17 | IC HA118195NT                                                   |         |
| CJ540    | 1-779-012-11 | JACK, PIN 5P (LINE IN/OUT)(L50,X5)                                      |                                                           | IC301    | 8-759-089-84 | IC BA7755AF-T1                                                  |         |
| CNJ980   | 1-779-013-11 | JACK, MINIATURE(CABLE BOX CONTROL)<br>(495,685HF,695HF)                 |                                                           | IC340    | 8-759-055-49 | IC AN3327K<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)         |         |
|          |              | < CONNECTOR >                                                           |                                                           | IC360    | 8-759-445-22 | IC TDA9603H/N2,557<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| CN101    | 1-506-470-11 | PIN, CONNECTOR 5P                                                       |                                                           | IC361    | 8-759-708-05 | IC NJM78L05A<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)       |         |
| * CN102  | 1-766-538-11 | CONNECTOR, BOARD TO BOARD 8P                                            |                                                           | IC403    | 8-742-042-00 | RE CEIVER HIC SBX1986-51                                        |         |
| * CN103  | 1-766-537-11 | CONNECTOR (HMD) 5P                                                      |                                                           | IC420    | 8-759-366-44 | IC uPD16312GB-3B4                                               |         |
| * CN104  | 1-766-716-11 | CONNECTOR, BOARD TO BOARD 3P                                            |                                                           | IC461    | 8-759-248-87 | IC MM1256XF-BE                                                  |         |
| CN140    | 1-506-468-11 | PIN, CONNECTOR 3P                                                       |                                                           | IC462    | 8-759-433-52 | IC AT24C01A-10SC-#B<br>(EXCEPT 495,685HF,695HF)                 |         |
| CN260    | 1-563-585-11 | CONNECTOR, FLEXIBLE 8P (495,L40,L50,X5)                                 |                                                           | IC462    | 8-759-433-53 | IC AT24C02N-10SC-#B (495,685HF,695HF)                           |         |
| CN260    | 1-766-986-11 | CONNECTOR, FFC/FPC 13P<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)     |                                                           | IC501    | 8-759-354-26 | IC BU6188FS-E2                                                  |         |
| * CN261  | 1-560-892-00 | PIN, CONNECTOR 4P                                                       |                                                           | IC540    | 8-759-100-96 | IC uPC4558G2                                                    |         |
| CN301    | 1-506-469-11 | PIN, CONNECTOR 4P                                                       |                                                           | IC600    | 8-759-438-18 | IC PQ12RD08                                                     |         |
| CN302    | 1-506-468-11 | PIN, CONNECTOR 3P                                                       |                                                           | IC733    | 8-742-037-00 | IC SBX1837-51<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)      |         |
|          |              | < JUMPER RESISTOR >                                                     |                                                           | IC980    | 8-759-356-27 | IC NJM2129M-TE2 (495,685HF,695HF)                               |         |
| JR100    | 1-216-296-00 | METAL CHIP                                                              | 0 5% 1/8W                                                 |          |              |                                                                 |         |
| JR101    | 1-216-296-00 | METAL CHIP                                                              | 0 5% 1/8W                                                 |          |              |                                                                 |         |
| JR102    | 1-216-296-00 | METAL CHIP                                                              | 0 5% 1/8W                                                 |          |              |                                                                 |         |
| JR105    | 1-216-296-00 | METAL CHIP                                                              | 0 5% 1/8W                                                 |          |              |                                                                 |         |
| JR106    | 1-216-296-00 | METAL CHIP                                                              | 0 5% 1/8W                                                 |          |              |                                                                 |         |

| Ref. No. | Part No.     | Description |   |    | Remarks | Ref. No.                                  | Part No.     | Description  |       |    | Remarks                  |
|----------|--------------|-------------|---|----|---------|-------------------------------------------|--------------|--------------|-------|----|--------------------------|
| JR107    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR346                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR108    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR347                                     | 1-216-295-00 | METAL CHIP   | 0     | 5% | 1/10W                    |
| JR111    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR350                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR112    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR351                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR113    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR352                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR114    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR354                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR115    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | JR355                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR116    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | JR402                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR117    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | JR403                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR119    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR405                                     | 1-216-295-00 | METAL CHIP   | 0     | 5% | 1/10W                    |
| JR120    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR500                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR221    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR501                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR222    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR502                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR250    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR503                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR251    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR505                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR253    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR506                                     | 1-216-295-00 | METAL CHIP   | 0     | 5% | 1/10W                    |
| JR257    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR507                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR258    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | JR508                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR259    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR509                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR260    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | JR510                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR301    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | JR511                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W                     |
| JR302    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | JR512                                     | 1-216-295-00 | METAL CHIP   | 0     | 5% | 1/10W                    |
| JR303    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | JR513                                     | 1-216-295-00 | METAL CHIP   | 0     | 5% | 1/10W                    |
| JR304    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | < JUMPER RESISTOR >                       |              |              |       |    |                          |
| JR305    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | JS702                                     | 1-216-296-00 | METAL CHIP   | 0     | 5% | 1/8W<br>(495,L40,L50,X5) |
| JR306    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | < COIL >                                  |              |              |       |    |                          |
| JR307    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L130                                      | 1-403-588-11 | COIL, CHOKER | 22uH  |    |                          |
| JR308    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L140                                      | 1-410-513-11 | INDUCTOR     | 22uH  |    |                          |
| JR309    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L161                                      | 1-410-513-11 | INDUCTOR     | 22uH  |    |                          |
| JR310    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L162                                      | 1-410-513-11 | INDUCTOR     | 22uH  |    |                          |
| JR311    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L163                                      | 1-410-513-11 | INDUCTOR     | 22uH  |    |                          |
| JR312    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L164                                      | 1-410-519-11 | INDUCTOR     | 68uH  |    |                          |
| JR313    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L201                                      | 1-410-516-11 | INDUCTOR     | 39uH  |    |                          |
| JR314    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L202                                      | 1-410-521-11 | INDUCTOR     | 100uH |    |                          |
| JR316    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L204                                      | 1-410-501-11 | INDUCTOR     | 2.2uH |    |                          |
| JR317    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L205                                      | 1-410-513-11 | INDUCTOR     | 22uH  |    |                          |
| JR318    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L206                                      | 1-410-501-11 | INDUCTOR     | 2.2uH |    |                          |
| JR319    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L207                                      | 1-410-518-41 | INDUCTOR     | 56uH  |    |                          |
| JR320    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L262                                      | 1-408-982-11 | INDUCTOR     | 100uH |    |                          |
| JR321    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L263                                      | 1-408-982-11 | INDUCTOR     | 100uH |    |                          |
| JR323    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L301                                      | 1-410-521-11 | INDUCTOR     | 100uH |    |                          |
| JR324    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L321                                      | 1-408-982-11 | INDUCTOR     | 100uH |    |                          |
| JR325    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L341                                      | 1-408-982-11 | INDUCTOR     | 100uH |    |                          |
| JR326    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L361                                      | 1-408-982-11 | INDUCTOR     | 100uH |    |                          |
| JR327    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |              |              |       |    |                          |
| JR329    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L501                                      | 1-410-513-11 | INDUCTOR     | 22uH  |    |                          |
| JR330    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L502                                      | 1-412-470-21 | INDUCTOR     | 22uH  |    |                          |
| JR331    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L503                                      | 1-410-513-11 | INDUCTOR     | 22uH  |    |                          |
| JR332    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L540                                      | 1-408-982-11 | INDUCTOR     | 100uH |    |                          |
| JR333    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L570                                      | 1-408-982-11 | INDUCTOR     | 100uH |    |                          |
| JR334    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L600                                      | 1-410-519-11 | INDUCTOR     | 68uH  |    |                          |
| JR335    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L601                                      | 1-408-970-21 | INDUCTOR     | 10uH  |    |                          |
| JR336    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L702                                      | 1-408-978-21 | INDUCTOR     | 47uH  |    |                          |
| JR337    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   | L703                                      | 1-410-501-11 | INDUCTOR     | 2.2uH |    |                          |
| JR338    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L704                                      | 1-410-501-11 | INDUCTOR     | 2.2uH |    |                          |
| JR339    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | L731                                      | 1-410-513-11 | INDUCTOR     | 22uH  |    |                          |
| JR340    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    | (675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |              |              |       |    |                          |
| JR341    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    |                                           |              |              |       |    |                          |
| JR342    | 1-216-295-00 | METAL CHIP  | 0 | 5% | 1/10W   |                                           |              |              |       |    |                          |
| JR345    | 1-216-296-00 | METAL CHIP  | 0 | 5% | 1/8W    |                                           |              |              |       |    |                          |

| Ref. No. | Part No.     | Description                                                        | Remarks  | Ref. No. | Part No.     | Description      | Remarks                                    |
|----------|--------------|--------------------------------------------------------------------|----------|----------|--------------|------------------|--------------------------------------------|
|          |              | < FLUORECENT INDICATOR >                                           |          |          |              |                  |                                            |
| ND420    | 1-517-595-11 | TUBE, FLUORESCENT INDICATOR                                        |          | R117     | 1-216-041-00 | METAL CHIP 470   | 5% 1/10W                                   |
|          |              | < PHOTO INTERRUPTER >                                              |          | R124     | 1-216-041-00 | METAL CHIP 470   | 5% 1/10W                                   |
| PH100    | 8-749-010-20 | PHOTO INTERRUPTER GP3S114                                          |          | R125     | 1-216-041-00 | METAL CHIP 470   | 5% 1/10W                                   |
| PH101    | 8-749-010-19 | PHOTO INTERRUPTER GP3S113                                          |          | R126     | 1-216-041-00 | METAL CHIP 470   | 5% 1/10W                                   |
|          |              | < IC LINK >                                                        |          | R130     | 1-216-041-00 | METAL CHIP 470   | 5% 1/10W                                   |
| △ PS403  | 1-533-586-31 | LINK, IC 315mA                                                     |          |          |              |                  |                                            |
| △ PS600  | 1-532-841-21 | LINK, IC 1 6A                                                      |          | R131     | 1-216-041-00 | METAL CHIP 470   | 5% 1/10W                                   |
|          |              | < TRANSISTOR >                                                     |          | R132     | 1-216-089-00 | METAL CHIP 47K   | 5% 1/10W                                   |
| Q100     | 8-729-025-92 | PHOTO TRANSISTOR PT380F                                            |          | R133     | 1-216-081-00 | METAL CHIP 22K   | 5% 1/10W                                   |
| Q101     | 8-729-025-92 | PHOTO TRANSISTOR PT380F                                            |          | R140     | 1-216-065-00 | METAL CHIP 4.7K  | 5% 1/10W                                   |
| Q102     | 8-729-281-53 | TRANSISTOR 2SC1815-GR                                              |          | R160     | 1-216-295-00 | METAL CHIP 0     | 5% 1/10W                                   |
| Q201     | 8-729-230-49 | TRANSISTOR 2SC2712-G                                               |          |          |              |                  |                                            |
| Q202     | 8-729-230-49 | TRANSISTOR 2SC2712-G                                               |          | R161     | 1-216-049-00 | METAL CHIP 1K    | 5% 1/10W<br>(495,L40 L70HF)                |
| Q208     | 8-729-230-49 | TRANSISTOR 2SC2712-G                                               |          | R162     | 1-216-049-00 | METAL CHIP 1K    | 5% 1/10W<br>(L60HF,L70HF,X6HF)             |
| Q209     | 8-729-216-21 | TRANSISTOR 2SA1162Y                                                |          | R163     | 1-216-049-00 | METAL CHIP 1K    | 5% 1/10W<br>(L50,X5)                       |
| Q210     | 8-729-230-49 | TRANSISTOR 2SC2712-G                                               |          | R164     | 1-216-121-91 | METAL GLAZE 1M   | 5% 1/10W                                   |
| Q211     | 8-729-230-49 | TRANSISTOR 2SC2712-G                                               |          | R165     | 1-216-039-00 | METAL CHIP 390   | 5% 1/10W                                   |
| Q260     | 8-729-230-49 | TRANSISTOR 2SC2712-G                                               |          |          |              |                  |                                            |
| Q301     | 8-729-281-53 | TRANSISTOR 2SC1815-GR                                              |          | R166     | 1-216-041-00 | METAL CHIP 470   | 5% 1/10W                                   |
| Q302     | 8-729-424-67 | TRANSISTOR UN2216 (495,L40,L50,X5)                                 |          | R167     | 1-216-295-00 | METAL CHIP 0     | 5% 1/10W                                   |
| Q321     | 8-729-802-91 | TRANSISTOR 2SD879                                                  |          | R168     | 1-216-295-00 | METAL CHIP 0     | 5% 1/10W                                   |
| Q361     | 8-729-102-14 | TRANSISTOR 2SD1021-F<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |          | R169     | 1-216-049-00 | METAL CHIP 1K    | 5% 1/10W<br>(495,685HF,695HF)              |
| Q362     | 8-729-102-14 | TRANSISTOR 2SD1021-F<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |          | R170     | 1-216-049-00 | METAL CHIP 1K    | 5% 1/10W                                   |
| Q363     | 8-729-102-14 | TRANSISTOR 2SD1021-F<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |          | R171     | 1-216-073-00 | METAL CHIP 10K   | 5% 1/10W                                   |
| Q364     | 8-729-010-05 | TRANSISTOR MSB709-RT1<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |          | R172     | 1-216-049-00 | METAL CHIP 1K    | 5% 1/10W                                   |
| Q501     | 8-729-216-21 | TRANSISTOR 2SA1162Y                                                |          | R173     | 1-216-049-00 | METAL CHIP 1K    | 5% 1/10W                                   |
| Q502     | 8-729-010-05 | TRANSISTOR MSB709-RT1                                              |          | R174     | 1-216-049-00 | METAL CHIP 1K    | 5% 1/10W                                   |
| Q600     | 8-729-140-93 | TRANSISTOR 2SB733-34                                               |          | R175     | 1-216-051-00 | METAL CHIP 1.2K  | 5% 1/10W                                   |
| Q601     | 8-729-010-25 | TRANSISTOR MSD601-RT1                                              |          |          |              |                  |                                            |
| Q602     | 8-729-140-98 | TRANSISTOR 2SD773-34                                               |          | R176     | 1-218-179-11 | METAL GLAZE 10M  | 5% 1/10W                                   |
| Q681     | 8-729-010-05 | TRANSISTOR MSB709-RT1                                              |          | R177     | 1-216-049-00 | METAL CHIP 1K    | 5% 1/10W                                   |
| Q731     | 8-729-421-19 | TRANSISTOR UN2213<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)     |          | R179     | 1-216-295-00 | METAL CHIP 0     | 5% 1/10W                                   |
|          |              | < RESISTOR >                                                       |          | R180     | 1-216-295-00 | METAL CHIP 0     | 5% 1/10W                                   |
| R100     | 1-216-081-00 | METAL CHIP 22K                                                     | 5% 1/10W | R181     | 1-216-073-00 | METAL CHIP 10K   | 5% 1/10W                                   |
| R101     | 1-216-033-00 | METAL CHIP 220                                                     | 5% 1/10W |          |              |                  |                                            |
| R102     | 1-216-033-00 | METAL CHIP 220                                                     | 5% 1/10W | R185     | 1-216-089-00 | METAL CHIP 47K   | 5% 1/10W                                   |
| R103     | 1-216-081-00 | METAL CHIP 22K                                                     | 5% 1/10W | R201     | 1-216-041-00 | METAL CHIP 470   | 5% 1/10W                                   |
| R104     | 1-216-113-00 | METAL CHIP 470K                                                    | 5% 1/10W | R202     | 1-216-069-00 | METAL CHIP 6 8K  | 5% 1/10W                                   |
| R105     | 1-216-113-00 | METAL CHIP 470K                                                    | 5% 1/10W | R203     | 1-216-049-00 | METAL CHIP 1K    | 5% 1/10W                                   |
| R106     | 1-216-057-00 | METAL CHIP 2.2K                                                    | 5% 1/10W | R204     | 1-216-047-91 | METAL GLAZE 820  | 5% 1/10W                                   |
| R107     | 1-216-049-00 | METAL CHIP 1K                                                      | 5% 1/10W |          |              |                  |                                            |
| R108     | 1-247-807-31 | CARBON 100                                                         | 5% 1/4W  | R205     | 1-216-037-00 | METAL CHIP 330   | 5% 1/10W                                   |
| R109     | 1-247-807-31 | CARBON 100                                                         | 5% 1/4W  | R206     | 1-216-037-00 | METAL CHIP 330   | 5% 1/10W                                   |
| R111     | 1-216-089-00 | METAL CHIP 47K                                                     | 5% 1/10W | R207     | 1-216-073-00 | METAL CHIP 10K   | 5% 1/10W                                   |
| R112     | 1-216-089-00 | METAL CHIP 47K                                                     | 5% 1/10W | R208     | 1-216-073-00 | METAL CHIP 10K   | 5% 1/10W                                   |
| R113     | 1-216-089-00 | METAL CHIP 47K                                                     | 5% 1/10W | R209     | 1-216-295-00 | METAL CHIP 0     | 5% 1/10W                                   |
| R114     | 1-216-089-00 | METAL CHIP 47K                                                     | 5% 1/10W |          |              |                  |                                            |
| R115     | 1-216-089-00 | METAL CHIP 47K                                                     | 5% 1/10W | R214     | 1-216-045-00 | METAL CHIP 680   | 5% 1/10W                                   |
|          |              |                                                                    |          | R218     | 1-208-798-11 | METAL GLAZE 4 7K | 0.50% 1/10W                                |
|          |              |                                                                    |          | R219     | 1-216-053-00 | METAL CHIP 1.5K  | 5% 1/10W                                   |
|          |              |                                                                    |          | R220     | 1-216-295-00 | METAL CHIP 0     | 5% 1/10W                                   |
|          |              |                                                                    |          | R222     | 1-216-051-00 | METAL CHIP 1 2K  | 5% 1/10W                                   |
|          |              |                                                                    |          |          |              |                  |                                            |
|          |              |                                                                    |          | R223     | 1-216-295-00 | METAL CHIP 0     | 5% 1/10W                                   |
|          |              |                                                                    |          | R224     | 1-216-295-00 | METAL CHIP 0     | 5% 1/10W<br>(495,685HF,695HF,L50,L70HF,X5) |
|          |              |                                                                    |          | R225     | 1-216-295-00 | METAL CHIP 0     | 5% 1/10W                                   |
|          |              |                                                                    |          | R226     | 1-216-025-91 | METAL GLAZE 100  | 5% 1/10W                                   |
|          |              |                                                                    |          | R227     | 1-216-025-91 | METAL GLAZE 100  | 5% 1/10W                                   |

**Note :**

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

**Note :**

Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

| Ref. No. | Part No.     | Description | Remarks                                                    | Ref. No. | Part No.     | Description | Remarks                                                     |
|----------|--------------|-------------|------------------------------------------------------------|----------|--------------|-------------|-------------------------------------------------------------|
| R228     | 1-216-057-00 | METAL CHIP  | 2.2K 5% 1/10W                                              | R310     | 1-216-129-00 | METAL CHIP  | 2.2M 5% 1/10W                                               |
| R229     | 1-216-055-00 | METAL CHIP  | 1 8K 5% 1/10W                                              | R311     | 1-216-053-00 | METAL CHIP  | 1.5K 5% 1/10W                                               |
| R230     | 1-216-045-00 | METAL CHIP  | 680 5% 1/10W                                               | R312     | 1-216-079-00 | METAL CHIP  | 18K 5% 1/10W                                                |
| R231     | 1-216-071-00 | METAL CHIP  | 8.2K 5% 1/10W                                              | R313     | 1-216-109-00 | METAL CHIP  | 330K 5% 1/10W                                               |
| R232     | 1-216-055-00 | METAL CHIP  | 1.8K 5% 1/10W                                              | R314     | 1-216-035-00 | METAL CHIP  | 270 5% 1/10W                                                |
| R234     | 1-216-049-00 | METAL CHIP  | 1K 5% 1/10W                                                | R315     | 1-216-073-00 | METAL CHIP  | 10K 5% 1/10W                                                |
| R235     | 1-216-073-00 | METAL CHIP  | 10K 5% 1/10W                                               | R316     | 1-216-071-00 | METAL CHIP  | 8.2K 5% 1/10W                                               |
| R236     | 1-216-049-00 | METAL CHIP  | 1K 5% 1/10W                                                | R317     | 1-216-079-00 | METAL CHIP  | 18K 5% 1/10W                                                |
| R237     | 1-216-057-00 | METAL CHIP  | 2.2K 5% 1/10W                                              | R318     | 1-216-075-00 | METAL CHIP  | 12K 5% 1/10W                                                |
| R238     | 1-216-057-00 | METAL CHIP  | 2.2K 5% 1/10W                                              | R319     | 1-216-043-91 | METAL GLAZE | 560 5% 1/10W<br>(495,L40,L50,X5)                            |
| R239     | 1-216-057-00 | METAL CHIP  | 2.2K 5% 1/10W                                              | R319     | 1-216-295-00 | METAL CHIP  | 0 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)     |
| R240     | 1-216-049-00 | METAL CHIP  | 1K 5% 1/10W                                                | R320     | 1-216-047-91 | METAL GLAZE | 820 5% 1/10W                                                |
| R243     | 1-216-061-00 | METAL CHIP  | 3.3K 5% 1/10W                                              | R321     | 1-216-017-91 | METAL GLAZE | 47 5% 1/10W                                                 |
| R260     | 1-216-044-00 | METAL CHIP  | 620 5% 1/10W                                               | R322     | 1-216-063-91 | METAL GLAZE | 3.9K 5% 1/10W                                               |
| R261     | 1-216-044-00 | METAL CHIP  | 620 5% 1/10W                                               | R323     | 1-217-671-11 | METAL CHIP  | 1 5% 1/10W                                                  |
| R262     | 1-216-021-00 | METAL CHIP  | 68 5% 1/10W<br>(495,L40,L50,X5)                            | R324     | 1-216-031-00 | METAL CHIP  | 180 5% 1/10W                                                |
| R262     | 1-216-025-91 | METAL GLAZE | 100 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  | R341     | 1-216-067-00 | METAL CHIP  | 5.6K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |
| R263     | 1-216-021-00 | METAL CHIP  | 68 5% 1/10W<br>(495,L40,L50,X5)                            | R342     | 1-216-051-00 | METAL CHIP  | 1.2K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |
| R263     | 1-216-025-91 | METAL GLAZE | 100 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  | R343     | 1-216-073-00 | METAL CHIP  | 10K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |
| R264     | 1-216-021-00 | METAL CHIP  | 68 5% 1/10W<br>(495,L40,L50,X5)                            | R344     | 1-216-079-00 | METAL CHIP  | 18K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |
| R264     | 1-216-025-91 | METAL GLAZE | 100 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  | R345     | 1-216-097-91 | METAL GLAZE | 100K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |
| R265     | 1-216-021-00 | METAL CHIP  | 68 5% 1/10W<br>(495,L40,L50,X5)                            | R346     | 1-216-065-00 | METAL CHIP  | 4.7K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |
| R265     | 1-216-025-91 | METAL GLAZE | 100 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  | R347     | 1-216-065-00 | METAL CHIP  | 4.7K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |
| R266     | 1-216-053-00 | METAL CHIP  | 1.5K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) | R350     | 1-216-033-00 | METAL CHIP  | 220 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |
| R266     | 1-216-055-00 | METAL CHIP  | 1.8K 5% 1/10W<br>(495,L40,L50,X5)                          | R351     | 1-216-035-00 | METAL CHIP  | 270 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |
| R267     | 1-216-073-00 | METAL CHIP  | 10K 5% 1/10W                                               | R356     | 1-216-035-00 | METAL CHIP  | 270 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |
| R268     | 1-216-081-00 | METAL CHIP  | 22K 5% 1/10W                                               | R361     | 1-216-033-00 | METAL CHIP  | 220 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |
| R269     | 1-216-061-00 | METAL CHIP  | 3.3K 5% 1/10W                                              | R362     | 1-216-033-00 | METAL CHIP  | 220 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |
| R270     | 1-216-081-00 | METAL CHIP  | 22K 5% 1/10W                                               | R363     | 1-216-033-00 | METAL CHIP  | 220 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |
| R271     | 1-216-049-00 | METAL CHIP  | 1K 5% 1/10W                                                | R364     | 1-216-049-00 | METAL CHIP  | 1K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)    |
| R272     | 1-216-077-00 | METAL CHIP  | 15K 5% 1/10W                                               | R365     | 1-216-049-00 | METAL CHIP  | 1K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)    |
| R273     | 1-216-077-00 | METAL CHIP  | 15K 5% 1/10W                                               | R366     | 1-216-049-00 | METAL CHIP  | 1K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)    |
| R274     | 1-216-073-00 | METAL CHIP  | 10K 5% 1/10W                                               | R367     | 1-216-049-00 | METAL CHIP  | 1K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)    |
| R275     | 1-216-073-00 | METAL CHIP  | 10K 5% 1/10W                                               | R368     | 1-216-133-00 | METAL CHIP  | 3.3M 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |
| R276     | 1-216-049-00 | METAL CHIP  | 1K 5% 1/10W                                                | R369     | 1-216-689-11 | METAL CHIP  | 39K 0.5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |
| R301     | 1-216-089-00 | METAL CHIP  | 47K 5% 1/10W<br>(495,L40,L50,X5)                           | R370     | 1-216-061-00 | METAL CHIP  | 3.3K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |
| R301     | 1-216-093-00 | METAL CHIP  | 68K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  | R371     | 1-216-689-11 | METAL CHIP  | 39K 0.5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |
| R302     | 1-216-067-00 | METAL CHIP  | 5.6K 5% 1/10W                                              | R372     | 1-216-061-00 | METAL CHIP  | 3.3K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |
| R303     | 1-216-093-00 | METAL CHIP  | 68K 5% 1/10W<br>(495,L40,L50,X5)                           | R373     | 1-216-689-11 | METAL CHIP  | 39K 0.5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |
| R304     | 1-216-093-00 | METAL CHIP  | 68K 5% 1/10W<br>(495,L50,X5)                               | R374     | 1-216-295-00 | METAL CHIP  | 0 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)     |
| R305     | 1-216-067-00 | METAL CHIP  | 5.6K 5% 1/10W<br>(495,L40,L50,X5)                          |          |              |             |                                                             |
| R306     | 1-216-073-00 | METAL CHIP  | 10K 5% 1/10W                                               |          |              |             |                                                             |
| R307     | 1-216-061-00 | METAL CHIP  | 3.3K 5% 1/10W                                              |          |              |             |                                                             |
| R308     | 1-216-067-00 | METAL CHIP  | 5.6K 5% 1/10W<br>(495,L50,X5)                              |          |              |             |                                                             |
| R309     | 1-216-067-00 | METAL CHIP  | 5.6K 5% 1/10W                                              |          |              |             |                                                             |

| Ref. No. | Part No.     | Description                                                            | Remarks |
|----------|--------------|------------------------------------------------------------------------|---------|
| R375     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)    |         |
| R376     | 1-216-097-91 | METAL GLAZE 100K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| R377     | 1-216-097-91 | METAL GLAZE 100K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| R378     | 1-216-083-00 | METAL CHIP 27K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |         |
| R379     | 1-216-073-00 | METAL CHIP 10K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |         |
| R380     | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |         |
| R381     | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |         |
| R382     | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |         |
| R383     | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |         |
| R386     | 1-216-295-00 | METAL CHIP 0 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)     |         |
| R387     | 1-216-295-00 | METAL CHIP 0 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)     |         |
| R388     | 1-216-295-00 | METAL CHIP 0 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)     |         |
| R401     | 1-249-407-11 | CARBON 150 5% 1/4W F                                                   |         |
| R405     | 1-216-061-00 | METAL CHIP 3.3K 5% 1/10W                                               |         |
| R406     | 1-216-061-00 | METAL CHIP 3.3K 5% 1/10W                                               |         |
| R407     | 1-216-073-00 | METAL CHIP 10K 5% 1/10W                                                |         |
| R408     | 1-216-073-00 | METAL CHIP 10K 5% 1/10W                                                |         |
| R409     | 1-216-013-00 | METAL CHIP 33 5% 1/10W                                                 |         |
| R410     | 1-216-073-00 | METAL CHIP 10K 5% 1/10W                                                |         |
| R411     | 1-216-013-00 | METAL CHIP 33 5% 1/10W                                                 |         |
| R412     | 1-216-089-00 | METAL CHIP 47K 5% 1/10W                                                |         |
| R413     | 1-216-089-00 | METAL CHIP 47K 5% 1/10W                                                |         |
| R414     | 1-216-053-00 | METAL CHIP 1.5K 5% 1/10W                                               |         |
| R415     | 1-216-053-00 | METAL CHIP 1.5K 5% 1/10W                                               |         |
| R417     | 1-216-057-00 | METAL CHIP 2.2K 5% 1/10W                                               |         |
| R418     | 1-216-057-00 | METAL CHIP 2.2K 5% 1/10W                                               |         |
| R419     | 1-216-059-00 | METAL CHIP 2.7K 5% 1/10W                                               |         |
| R420     | 1-216-059-00 | METAL CHIP 2.7K 5% 1/10W                                               |         |
| R421     | 1-216-295-00 | METAL CHIP 0 5% 1/10W                                                  |         |
| R422     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W                                                 |         |
| R423     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W                                                 |         |
| R424     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W                                                 |         |
| R425     | 1-216-085-00 | METAL CHIP 33K 5% 1/10W                                                |         |
| R426     | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W                                               |         |
| R440     | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W                                               |         |
| R441     | 1-216-069-00 | METAL CHIP 6.8K 5% 1/10W<br>(495 675HF,676HF,685HF,695HF)              |         |
| R442     | 1-216-077-00 | METAL CHIP 15K 5% 1/10W<br>(495 675HF,676HF,685HF,695HF)               |         |
| R445     | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W<br>(L50,L70HF,X5)                             |         |
| R446     | 1-216-069-00 | METAL CHIP 6.8K 5% 1/10W<br>(L50,L70HF,X5)                             |         |
| R447     | 1-216-077-00 | METAL CHIP 15K 5% 1/10W<br>(L50,L70HF,X5)                              |         |
| R448     | 1-216-089-00 | METAL CHIP 47K 5% 1/10W                                                |         |
| R462     | 1-216-105-91 | METAL GLAZE 220K 5% 1/10W                                              |         |
| R463     | 1-216-113-00 | METAL CHIP 470K 5% 1/10W                                               |         |
| R464     | 1-216-089-00 | METAL CHIP 47K 5% 1/10W                                                |         |
| R502     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W                                                 |         |

| Ref. No. | Part No.     | Description                                                            | Remarks |
|----------|--------------|------------------------------------------------------------------------|---------|
| R503     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W                                                 |         |
| R504     | 1-216-045-00 | METAL CHIP 680 5% 1/10W                                                |         |
| R505     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W                                                 |         |
| R506     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W                                                 |         |
| R507     | 1-216-097-91 | METAL GLAZE 100K 5% 1/10W                                              |         |
| R540     | 1-216-021-00 | METAL CHIP 68 5% 1/10W                                                 |         |
| R541     | 1-249-407-11 | CARBON 150 5% 1/4W F                                                   |         |
| R543     | 1-249-408-11 | CARBON 180 5% 1/4W F                                                   |         |
| R544     | 1-216-025-91 | METAL GLAZE 100 5% 1/10W                                               |         |
| R560     | 1-216-022-00 | METAL CHIP 75 5% 1/10W                                                 |         |
| R570     | 1-216-041-00 | METAL CHIP 470 5% 1/10W                                                |         |
| R571     | 1-216-041-00 | METAL CHIP 470 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |         |
| R572     | 1-216-097-91 | METAL GLAZE 100K 5% 1/10W                                              |         |
| R573     | 1-216-097-91 | METAL GLAZE 100K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF) |         |
| R574     | 1-216-097-91 | METAL GLAZE 100K 5% 1/10W                                              |         |
| R575     | 1-216-097-91 | METAL GLAZE 100K 5% 1/10W                                              |         |
| R600     | 1-249-417-11 | CARBON 1K 5% 1/4W F                                                    |         |
| R601     | 1-216-430-11 | METAL OXIDE 390 5% 1W F                                                |         |
| R602     | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W                                               |         |
| R603     | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W                                               |         |
| R604     | 1-249-413-11 | CARBON 470 5% 1/4W F                                                   |         |
| R605     | 1-215-857-11 | METAL OXIDE 10 5% 1W F                                                 |         |
| R606     | 1-215-908-00 | METAL OXIDE 33 5% 3W F                                                 |         |
| R608     | 1-249-413-11 | CARBON 470 5% 1/4W F                                                   |         |
| R609     | 1-249-413-11 | CARBON 470 5% 1/4W F                                                   |         |
| R610     | 1-249-413-11 | CARBON 470 5% 1/4W F                                                   |         |
| R701     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W                                                 |         |
| R702     | 1-216-295-00 | METAL CHIP 0 5% 1/10W                                                  |         |
| △ R705   | 1-212-893-00 | FUSIBLE 330 5% 1/4W F                                                  |         |
| R706     | 1-216-113-00 | METAL CHIP 470K 5% 1/10W                                               |         |
| R708     | 1-216-295-00 | METAL CHIP 0 5% 1/10W                                                  |         |
| R712     | 1-216-295-00 | METAL CHIP 0 5% 1/10W                                                  |         |
| R731     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)    |         |
| R732     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)    |         |
| R733     | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)  |         |
| R734     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)    |         |
| R735     | 1-216-049-00 | METAL CHIP 1K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)    |         |
| R736     | 1-216-067-00 | METAL CHIP 5.6K 5% 1/10W<br>(495,L40,L50,X5)                           |         |
| R736     | 1-216-295-00 | METAL CHIP 0 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)     |         |
| R737     | 1-216-081-00 | METAL CHIP 22K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |         |
| R738     | 1-216-081-00 | METAL CHIP 22K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |         |
| R739     | 1-216-073-00 | METAL CHIP 10K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)   |         |
| R740     | 1-216-295-00 | METAL CHIP 0 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)     |         |
| R741     | 1-216-295-00 | METAL CHIP 0 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)     |         |
| R742     | 1-216-295-00 | METAL CHIP 0 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)     |         |

**Note :**  
The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

**Note :**  
Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

| Ref. No. | Part No.     | Description                                                              | Remarks | Ref. No. | Part No.     | Description                                                          | Remarks |
|----------|--------------|--------------------------------------------------------------------------|---------|----------|--------------|----------------------------------------------------------------------|---------|
| R747     | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)    |         | D105     | 8-719-054-32 | DIODE ERA15-06                                                       |         |
| R980     | 1-216-295-00 | METAL CHIP 0 5% 1/10W<br>(495,685HF,695HF)                               |         | D106     | 8-719-058-91 | DIODE AG01A                                                          |         |
|          |              | < VARIABLE RESISTOR >                                                    |         | D107     | 8-719-920-32 | DIODE ERA15-02                                                       |         |
| RV731    | 1-241-766-11 | RES, ADJ, CERMET 47K<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)        |         | D108     | 8-719-911-19 | DIODE 1SS119                                                         |         |
|          |              | < SWITCH >                                                               |         | D109     | 8-719-109-61 | DIODE RD30ES                                                         |         |
| S100     | 1-570-953-11 | SWITCH, PUSH (1 KEY)(REC PROOF)                                          |         | D201     | 9-900-535-01 | DIODE AU02Z                                                          |         |
| S401     | 1-571-532-32 | SWITCH, TACTIL (POWER)                                                   |         | D202     | 8-719-052-52 | DIODE 31DF2-FC5                                                      |         |
| S402     | 1-571-532-32 | SWITCH, TACTIL (EJECT)                                                   |         | D203     | 8-719-018-83 | DIODE D2S4M                                                          |         |
| S403     | 1-571-532-32 | SWITCH, TACTIL (REC)                                                     |         | D204     | 9-900-535-01 | DIODE AU02Z                                                          |         |
| S404     | 1-571-532-32 | SWITCH, TACTIL (PAUSE)                                                   |         | D205     | 8-719-160-62 | DIODE RD15FB2                                                        |         |
| S405     | 1-571-532-32 | SWITCH, TACTIL (CH +)                                                    |         |          |              | < FUSE >                                                             |         |
| S406     | 1-571-532-32 | SWITCH, TACTIL (CH -)                                                    |         | △F101    | 1-533-296-11 | FUSE,                                                                |         |
| S412     | 1-571-532-32 | SWITCH, TACTIL (EASY SET UP)<br>(495 675HF,676HF,685HF,695HF)            |         |          |              | < IC >                                                               |         |
| S701     | 1-571-588-11 | SWITCH, SLIDE (3CH/4CH)                                                  |         | △IC201   | 8-759-420-19 | IC AN1431T                                                           |         |
|          |              | < TRANSFORMER >                                                          |         |          |              | < COIL >                                                             |         |
| T321     | 1-431-097-11 | TRANSFORMER, BIAS OSCILLATION                                            |         | L101     | 1-403-598-11 | LINE FILTER                                                          |         |
|          |              | < TUNER >                                                                |         |          |              | < PHOTOCOUPLER >                                                     |         |
| TU701    | 1-693-353-11 | TUNER, (IF) SOLID TYPE (495,L40,L50,X5)                                  |         | △PC101   | 8-719-018-29 | PHOTOCOUPLER ON3131                                                  |         |
| TU701    | 1-XXX-XXX-XX | TUNER, (IF) SOLID TYPE<br>(675HF,676HF,685HF,695HFL60HF,L70HF,X6HF)      |         |          |              | < TRANSISTOR >                                                       |         |
|          |              | < VIBRATOR >                                                             |         | Q101     | 8-729-904-98 | TRANSISTOR 2SC4054                                                   |         |
| X160     | 1-760-494-11 | VIBRATOR, CRYSTAL 16MHz                                                  |         | Q102     | 8-729-012-31 | TRANSISTOR 2SC4040Q                                                  |         |
| X161     | 1-579-463-11 | VIBRATOR, CRYSTAL 32.768kHz                                              |         |          |              | < RESISTOR >                                                         |         |
| X202     | 1-577-380-11 | VIBRATOR, CRYSTAL 3.579545MHz                                            |         | R108     | 1-260-314-51 | CARBON 68 1/2W                                                       |         |
| X501     | 1-567-307-11 | OSCILLATOR, CRYSTAL                                                      |         | R109     | 1-260-314-51 | CARBON 68 1/2W                                                       |         |
|          |              |                                                                          |         | R110     | 1-244-867-11 | CARBON 560 1/4W                                                      |         |
|          |              |                                                                          |         | R110     | 1-244-868-11 | CARBON                                                               |         |
|          |              |                                                                          |         | R110     | 1-244-869-11 | CARBON                                                               |         |
|          |              |                                                                          |         | R110     | 1-244-870-11 | CARBON                                                               |         |
|          |              |                                                                          |         | R110     | 1-244-871-11 | CARBON                                                               |         |
| △        | 1-468-168-11 | POWER BLOCK SR701 (EXCEPT CHILEAN,PX)<br>*****<br>(Ref.No.:5,000 Series) |         |          |              |                                                                      |         |
|          |              | < CAPACITOR >                                                            |         | △        | 1-468-169-11 | POWER BLOCK HS-821SF (CHILEAN,PX)<br>*****<br>(Ref.No.:6,000 Series) |         |
| C101     | 9-902-834-01 | METALIZED 0.1uF 250V                                                     |         |          |              | < CAPACITOR >                                                        |         |
| C108     | 9-980-070-01 | ELECT 120uF 200V                                                         |         | C108     | 9-980-072-01 | ELECT 150uF 400V                                                     |         |
| C109     | 1-126-963-11 | ELECT 4.7uF 50V                                                          |         | C112     | 1-107-882-11 | ELECT 100uF 16V                                                      |         |
| C114     | 1-130-491-51 | FILM 0.047uF 50V                                                         |         | C201     | 1-126-967-11 | ELECT 47uF 50V                                                       |         |
| C202     | 1-126-967-11 | ELECT 47uF 50V                                                           |         | C202     | 1-111-040-11 | ELECT 820uF 16V                                                      |         |
| C203     | 1-126-183-11 | ELECT 1000uF 16V                                                         |         | C203     | 1-126-936-11 | ELECT 470uF 16V                                                      |         |
| C204     | 1-126-935-11 | ELECT 470uF 16V                                                          |         | C204     | 9-980-071-01 | ELECT 1000uF 10V                                                     |         |
| C205     | 1-126-797-11 | ELECT 1000uF 10V                                                         |         | C205     | 1-126-925-11 | ELECT 470uF 10V                                                      |         |
| C206     | 1-126-935-11 | ELECT 470uF 16V                                                          |         | C206     | 1-104-661-11 | ELECT 330uF 16V                                                      |         |
| C207     | 1-126-933-11 | ELECT 100uF 16V                                                          |         | C207     | 1-126-960-11 | ELECT 1uF 50V                                                        |         |
| C208     | 1-126-960-11 | ELECT 1uF 50V                                                            |         | C212     | 1-126-964-11 | ELECT 10uF 50V                                                       |         |
|          |              | < DIODE >                                                                |         |          |              |                                                                      |         |
| D101     | 8-719-047-70 | DIODE 1A4                                                                |         |          |              |                                                                      |         |
| D102     | 8-719-047-70 | DIODE 1A4                                                                |         |          |              |                                                                      |         |
| D103     | 8-719-047-70 | DIODE 1A4                                                                |         |          |              |                                                                      |         |
| D104     | 8-719-047-70 | DIODE 1A4                                                                |         |          |              |                                                                      |         |

**Note :**  
The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

**Note :**  
Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

# POWER BLOCK

| Ref. No.         | Part No.     | Description                           | Remarks |
|------------------|--------------|---------------------------------------|---------|
| < DIODE >        |              |                                       |         |
| D101             | 8-719-510-88 | DIODE                                 | S1WBA60 |
| D102             | 8-719-312-16 | DIODE                                 | EG01    |
| D104             | 9-980-073-01 | DIODE                                 | 1SS270A |
| D106             | 8-719-110-30 | DIODE                                 | RD12S   |
| D201             | 8-719-052-89 | DIODE                                 | D1NL40  |
| D202             | 8-719-018-25 | DIODE                                 | D2L20U  |
| D203             | 8-719-018-83 | DIODE                                 | D2S4M   |
| D204             | 8-719-026-52 | DIODE                                 | 10ELS2  |
| △D205            | 8-719-160-68 | DIODE                                 | RD18FB  |
| < FUSE >         |              |                                       |         |
| △F101            | 1-532-203-11 | FUSE                                  | 2A 250V |
| < IC >           |              |                                       |         |
| △IC101           | 9-939-634-01 | IC                                    | MIP164  |
| △IC201           | 8-759-420-19 | IC                                    | AN1431T |
| < PHOTOCOUPLER > |              |                                       |         |
| △PC101           | 8-749-924-84 | PHOTOCOUPLER                          | PS2561  |
| MISCELLANEOUS    |              |                                       |         |
| *****            |              |                                       |         |
| △11              | 1-762-844-21 | SWITCH, ROTARY (L50, L70HF, X5)       |         |
| △58              | 1-468-168-11 | POWER BLOCK SR701(EXCEPT Chilean, PX) |         |
| △58              | 1-468-169-11 | POWER BLOCK HS-821SF (Chilean, PX)    |         |
| △9               | 1-777-851-21 | CORD, POWER(US, Canadian)             |         |
| △9               | 1-777-854-21 | CORD, POWER(Mexican, Panamanian)      |         |
| △9               | 1-777-857-21 | CORD, POWER(Chilean, PX)              |         |

| Ref. No.                        | Part No.     | Description                           | Remarks                 |
|---------------------------------|--------------|---------------------------------------|-------------------------|
| ACCESSORIES & PACKING MATERIALS |              |                                       |                         |
| *****                           |              |                                       |                         |
| 1-575-334-11                    |              | CORD, CONNECTION                      | (FOR AUDIO/VIDEO)(1.5m) |
| 1-696-592-11                    |              | CORD, CONNECTION (NTSC)(FOR RF)(1.5m) |                         |
| 1-769-181-41                    |              | MOUSE, INTERIENET CABLE (495, 695HF)  |                         |
| 3-856-995-11                    |              | MANUAL, INSTRUCTION (ENGLISH)         | (675HF,676HF)           |
| 3-856-995-21                    |              | MANUAL, INSTRUCTION (FRENCH)          | (675HF:Canadian)        |
| 3-858-077-11                    |              | MANUAL, INSTRUCTION (SPANISH)         | (L50, L70HF, X5)        |
| 3-858-382-11                    |              | MANUAL, INSTRUCTION (SPANISH)(L40)    |                         |
| 3-858-384-11                    |              | MANUAL, INSTRUCTION (SPANISH)         | (L60HF, X6HF)           |
| 3-858-385-11                    |              | MANUAL, INSTRUCTION (ENGLISH)(495)    |                         |
| 3-858-385-21                    |              | MANUAL, INSTRUCTION (FRENCH)          | (495:Canadian)          |
| 3-858-386-11                    |              | MANUAL, INSTRUCTION (ENGLISH)(695HF)  |                         |
| 3-858-386-21                    |              | MANUAL, INSTRUCTION (FRENCH)          | (695HF Canadian)        |
| 3-859-040-11                    |              | MANUAL, INSTRUCTION (ENGLISH)(685HF)  |                         |
| 3-961-581-01                    |              | SHEET, PROTECTION                     |                         |
| 3-972-522-01                    |              | INDIVIDUAL CARTON (675HF)             |                         |
| 3-972-522-11                    |              | INDIVIDUAL CARTON (695HF)             |                         |
| 3-972-522-21                    |              | INDIVIDUAL CARTON (495)               |                         |
| 3-972-522-31                    |              | INDIVIDUAL CARTON (676HF)             |                         |
| 3-972-522-41                    |              | INDIVIDUAL CARTON (685HF)             |                         |
| 3-972-523-01                    |              | CUSHION                               |                         |
| 3-972-525-01                    |              | SPACER                                |                         |
| 3-973-678-02                    |              | INDIVIDUAL CARTON (L40)               |                         |
| 3-973-678-12                    |              | INDIVIDUAL CARTON (L50)               |                         |
| 3-973-678-22                    |              | INDIVIDUAL CARTON (L70HF)             |                         |
| 3-973-678-32                    |              | INDIVIDUAL CARTON (L60HF)             |                         |
| 3-973-678-42                    |              | INDIVIDUAL CARTON (X6HF)              |                         |
| 3-973-678-52                    |              | INDIVIDUAL CARTON (X5)                |                         |
| *****                           |              |                                       |                         |
| HARDWARE LIST                   |              |                                       |                         |
| *****                           |              |                                       |                         |
| #1                              | 7-682-547-04 | SCREW +P 3X6                          |                         |
| #2                              | 7-685-646-79 | SCREW (3X8)                           |                         |
| #5                              | 7-624-190-61 | STOP RING 2 4, TYPE-CS                |                         |
| #6                              | 7-628-254-10 | SCREW +PS2.6X6                        |                         |
| #7                              | 7-624-106-04 | STOP RING 3.0, TYPE-E                 |                         |
| #8                              | 7-682-645-01 | SCREW +PS3X4                          |                         |

## Note :

The components identified by mark △ or dotted line with mark △ are critical for safety  
Replace only with part number specified

## Note :

Les composants identifiés par une marque △ sont critiques pour la sécurité  
Ne les remplacer que par une pièce portant le numéro spécifié.

## SECTION 6

### INTERFACE, IC PIN FUNCTION DESCRIPTION

#### 6-1. SYSTEM CONTROL — MECHANISM BLOCK INTERFACE (MA-289 board IC160)

| Signal  | Pin No.                 | I/O | EJECTED | CASSETTE<br>LOADING | CASSETTE<br>UNLOADING | TAPE<br>THREADING | TAPE<br>UNTHREADING | STOP | FF | REW | PB | REC |
|---------|-------------------------|-----|---------|---------------------|-----------------------|-------------------|---------------------|------|----|-----|----|-----|
| CW      | MA-289 Board<br>IC160 ② | O   | *5      | H                   | L                     | H                 | L                   | *5   | *5 | *5  | *5 | *5  |
| CAM     | MA-289 Board<br>IC160 ⑦ | O   | *5      | *5                  | *5                    | *5                | *5                  | *5   | *5 | *5  | *5 | *5  |
| MODE 1  | MA-289 Board<br>IC160 ② | I   | —       | —                   | —                     | —                 | —                   | H    | H  | H   | H  | H   |
| MODE 2  | MA-289 Board<br>IC160 ② | I   | —       | —                   | —                     | —                 | —                   | L    | L  | L   | H  | H   |
| MODE 3  | MA-289 Board<br>IC160 ⑦ | I   | —       | —                   | —                     | —                 | —                   | H    | H  | H   | L  | L   |
| MODE 4  | MA-289 Board<br>IC160 ② | I   | —       | —                   | —                     | —                 | —                   | H    | L  | L   | L  | L   |
| REC PRF | MA-289 Board<br>IC160 ③ | I   | L       | *1                  | *1                    | *1                | *1                  | *1   | *1 | *1  | *1 | *1  |
| T REEL  | MA-289 Board<br>IC160 ④ | I   | H/L     | H/L                 | H/L                   | H/L               | H/L                 | H/L  | *2 | *2  | *2 | *2  |
| S REEL  | MA-289 Board<br>IC160 ⑤ | I   | H/L     | H/L                 | H/L                   | *2                | *2                  | H/L  | *2 | *2  | *2 | *2  |
| END LED | MA-289 Board<br>IC160 ⑥ | O   | L       | *3                  | *3                    | *3                | *3                  | *3   | *3 | *3  | *3 | *3  |
| T SENS  | MA-289 Board<br>IC160 ⑦ | I   | *3      | *3                  | *3                    | *4                | *4                  | *4   | *4 | *4  | *4 | *4  |
| S SENS  | MA-289 Board<br>IC160 ⑥ | I   | *3      | *3                  | *3                    | *4                | *4                  | *4   | *4 | *4  | *4 | *4  |

- \*1. "L" When erasing protection tab is bent. "H" when not bent.
- \*2. Pulse of period in proportion to reel rotating speed.
- \*3. Approx. 2 msec period "H" pulse when tape top or end is detected.
- \*4. Normally "L". 2 msec period "H" pulse when tape top or end is detected.
- \*5. Hi-Z

#### 6-2. SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE (MA-289 board IC160)

| Signal   | Pin No.                 | I/O | STOP | FF | REW | TAPE<br>THREADING | TAPE<br>UNTHREADING | PB | REC |
|----------|-------------------------|-----|------|----|-----|-------------------|---------------------|----|-----|
| CTL IN+  | MA-289 Board<br>IC160 ② | O   | *7   | *7 | *7  | *7                | *7                  | *7 | *1  |
| DRUM PG  | MA-289 Board<br>IC160 ③ | I   | *3   | *3 | *3  | *3                | *3                  | *3 | *3  |
| DRUM FG  | MA-289 Board<br>IC160 ⑦ | I   | *4   | *4 | *4  | *4                | *4                  | *4 | *4  |
| CAP FG   | MA-289 Board<br>IC160 ⑤ | I   | H/L  | *2 | *2  | *5                | *5                  | *2 | *2  |
| CAP REV  | MA-289 Board<br>IC160 ⑥ | O   | H/L  | L  | H   | L                 | H                   | L  | L   |
| CAP ERR  | MA-289 Board<br>IC160 ⑦ | O   | L    | *6 | *6  | *6                | *6                  | *6 | *6  |
| DRUM ERR | MA-289 Board<br>IC160 ⑦ | O   | *6   | *6 | *6  | *6                | *6                  | *6 | *6  |

- \*1. 30 Hz pulse
- \*2. Pulse of period in proportion to tape speed.
- \*3. 30 Hz "H" pulse.
- \*4. 720 Hz pulse.
- \*5. Unstable period pulse.
- \*6. DC voltage 1 ~ 5V.
- \*7. Hi-Z (2.5V).

### 6-3. SYSTEM CONTROL — SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-289 board IC160)

| Signal          | Pin No.              | I/O | I/O level                                                         |
|-----------------|----------------------|-----|-------------------------------------------------------------------|
| RESET           | MA-289 Board IC160 ④ | I   | Normally "H". "L" when service interruption detected or restored. |
| 12C DATA1       | MA-289 Board IC160 ② | I/O | Serial communication data to audio microprocessor.                |
| 12C CLOCK1      | MA-289 Board IC160 ① | O   | Serial communication clock to audio microprocessor.               |
| 12C DATA VIDEO  | MA-289 Board IC160 ⑤ | I/O | Serial communication data to video microprocessor.                |
| 12C CLOCK VIDEO | MA-289 Board IC160 ⑥ | O   | Serial communication clock to video microprocessor.               |
| (RP) S OUT1     | MA-289 Board IC160 ⑧ | I/O | Serial communication data to RP microprocessor                    |
| (RP) S CLK1     | MA-289 Board IC160 ⑦ | O   | Serial communication clock to RP microprocessor.                  |

### 6-4. SYSTEM CONTROL AND RF MODULATOR — INPUT SELECTION BLOCK INTERFACE (MA-289 board IC501)

| Signal  | Pin No.              | I/O | I/O level                      |
|---------|----------------------|-----|--------------------------------|
| ANT SEL | MA-289 Board IC160 ② | O   | "L" when RF modulator through. |

### 6-5. SYSTEM CONTROL — VIDEO/RP BLOCK INTERFACE (MA-289 board IC160)

| Signal | Pin No.              | I/O | STOP/FF<br>/REW | TAPE<br>LOADING | TAPE<br>UNLOADING | PB | REC | REC<br>PAUSE |
|--------|----------------------|-----|-----------------|-----------------|-------------------|----|-----|--------------|
| RF SWP | MA-289 Board IC160 ⑩ | O   | *1              | *1              | *1                | *1 | *1  | *1           |
| QVD    | MA-289 Board IC160 ⑬ | O   | L               | L               | L                 | *2 | L   | L            |
| REC P  | MA-289 Board IC160 ④ | O   | L               | L               | L                 | L  | L   | H            |
| C SYNC | MA-289 Board IC160 ⑭ | I   | *3              | *3              | *3                | *3 | *3  | *3           |

\*1. Synchronized with drum rotation. 30Hz 50% duty pulse.

\*2. Normal "L". "H" when video signal is not regenerated.

\*3. Composite sync signal (positive).

### 6-6. SYSTEM CONTROL — AUDIO BLOCK INTERFACE (MA-289 board IC160)

| Signal | Pin No.              | I/O | STOP/FF<br>/REW | TAPE<br>LOADING | TAPE<br>UNLOADING | PB | REC | REC<br>PAUSE |
|--------|----------------------|-----|-----------------|-----------------|-------------------|----|-----|--------------|
| A MUTE | MA-289 Board IC160 ④ | O   | L               | L               | L                 | L  | L   | H            |

# 6-7. SERVO/SYSTEM CONTROL MICROPROCESSOR (MA-289 BOARD IC160)

| Pin.No. | Signal      | I/O | Function                                             |
|---------|-------------|-----|------------------------------------------------------|
| 1       | —           | —   | —                                                    |
| 2       | —           | —   | —                                                    |
| 3       | TU AFT      | I   | Tuner analog AFT input                               |
| 4       | FUNC KEY 2  | I   | 9 key input                                          |
| 5       | FUNC KEY 1  | I   | 9 key input                                          |
| 6       | SSENS       | I   | Tape end sensor                                      |
| 7       | TSSENS      | I   | Tape top sensor                                      |
| 8       | VIDEO RF    | I   | Video RF input                                       |
| 9       | AF ENV      | I   | HiFi envelope                                        |
| 10      | —           | —   | —                                                    |
| 11      | —           | —   | —                                                    |
| 12      | STEREO      | I   | Tuner stereo detection input L Stereo                |
| 13      | QVD         | O   | Quasi VD                                             |
| 14      | REMOCON     | I   | Infrared ray catcher                                 |
| 15      | F MONO      | O   | Forced mono                                          |
| 16      | CAP RVS     | O   | Captain reverse                                      |
| 17      | I2C CLOCK 1 | O   | I2C clock (EEPROM, HiFi, PLL MOD)                    |
| 18      | RF SWP      | O   | RF switching pulse                                   |
| 19      | AF SWP      | O   | HiFi switching pulse                                 |
| 20      | END LED     | O   | End sensor LED output                                |
| 21      | ANT SEL     | O   | TV/VTR RF modulator                                  |
| 22      | PLL DATA    | I/O | Tuner PLL data (TU/I2C data (EEPROM, HiFi, PLL MOD)) |
| 23      | PLL CLK     | O   | Tuner PLL clock                                      |
| 24      | TENABLE     | O   | Tuner enable                                         |
| 25      | SAP         | I   | SAP discrimination                                   |
| 26      | MODE 4      | I   | Cam encoding data 4                                  |
| 27      | MODE 3      | I   | Cam encoding data 3                                  |
| 28      | MODE 2      | I   | Cam encoding data 2                                  |
| 29      | MODE 1      | I   | Cam encoding data 1                                  |
| 30      | RECPRF      | I   | Mis-record prevention switch signal input            |
| 31      | DEST1       | I   | Destination discrimination input 1                   |
| 32      | DEST2       | I   | Destination discrimination input 2                   |
| 33      | DEST3       | I   | Destination discrimination input 3                   |
| 34      | NUB         | I   | Ground                                               |
| 35      | NUA         | I   | Ground                                               |
| 36      | CLKSEL      | I   | 5V                                                   |
| 37      | VCC         | I   | 5V                                                   |
| 38      | XIN         | I   | 16MHz                                                |
| 39      | XOUT        | O   | 16MHz                                                |
| 40      | VSS         | I   | Ground                                               |
| 41      | XCIN        | I   | 32kHz                                                |
| 42      | XCOU        | O   | 32kHz                                                |
| 43      | RESET       | I   | Reset signal input                                   |
| 44      | NT JUDGE    | I   | L NTSC                                               |
| 45      | —           | —   | —                                                    |
| 46      | CBC ON      | O   | Cable box control signal output                      |
| 47      | VMUTE       | O   | Video-mute for EDS                                   |
| 48      | AMUTE       | O   | Audio mute                                           |
| 49      | REC P       | O   | HiFi audio record control                            |
| 50      | VPB         | O   | Audio record control L Playback                      |

| Pin.No. | Signal       | I/O | Function                               |
|---------|--------------|-----|----------------------------------------|
| 51      | I2C CLOCK VI | O   | I2C clock (Video)                      |
| 52      | I2C DATA VI  | O   | I2C data (Video)                       |
| 53      | TA MUTE      | O   | Tuner-audio mute                       |
| 54      | DMS UP       | I   | DMS control                            |
| 55      | DMS DOWN     | I   | DMS control                            |
| 56      | P CONT M12   | O   | Motor 12V control                      |
| 57      | CAM          | I/O | Cam motor control 1                    |
| 58      | CW           | I/O | Cam motor control 2                    |
| 59      | P CONT SW12  | O   | SW 12V control                         |
| 60      | —            | —   | —                                      |
| 61      | —            | —   | —                                      |
| 62      | —            | —   | —                                      |
| 63      | —            | —   | —                                      |
| 64      | OSD CS       | O   | OSD chip select                        |
| 65      | SOUT 1       | O   | Serial out Ch1 (RP)                    |
| 66      | FLD CS       | O   | Fluorescent display driver chip select |
| 67      | SCLK 1       | O   | Serial clock Ch1 (RP)                  |
| 68      | SOUT 0       | O   | Serial out Ch0 (FLD, OSD)              |
| 69      | SIN 0        | I   | Serial in Ch0 (FLD, OSD)               |
| 70      | SCLK 0       | O   | Serial clock Ch0 (FLD, OSD)            |
| 71      | —            | —   | —                                      |
| 72      | BUZZER       | I/O | Buzzer                                 |
| 73      | SIRCS OUT    | O   | Remote control signal output (CBC)     |
| 74      | MAINSAP      | O   | MAINSAP select                         |
| 75      | PFALL        | I   | Power fail detection input             |
| 76      | T-OUT        | O   | Timing-out                             |
| 77      | CAP ERR      | O   | Captain error output                   |
| 78      | DRUM ERR     | O   | Drum error output                      |
| 79      | SREEL        | I   | Supply reel sensor                     |
| 80      | TREEL        | I   | Take-up reel sensor                    |
| 81      | —            | —   | —                                      |
| 82      | CHECK        | I   | Check input                            |
| 83      | —            | —   | —                                      |
| 84      | CSYNC        | I   | Composite sync signal input            |
| 85      | CAPFG        | I   | Captain FG signal input                |
| 86      | DRMPG        | I   | Drum FG signal input                   |
| 87      | DRMPG        | I   | Drum FG signal input                   |
| 88      | AMP VSS      | I   | CTL amp                                |
| 89      | AMP VREF OUT | O   | CTL amp                                |
| 90      | AMP VREF IN  | I   | CTL amp                                |
| 91      | CTLIN-       | I/O | CTL signal I/O                         |
| 92      | CTLIN+       | I/O | CTL signal I/O                         |
| 93      | CTL SWOUT    | O   | CTL amp                                |
| 94      | CTL AMP IN   | I   | CTL amp                                |
| 95      | AMPC         | I   | CTL amp                                |
| 96      | CTL VSS      | I   | CTL amp                                |
| 97      | CTL AMP OUT  | O   | CTL amp                                |
| 98      | AMPVCC       | I   | CTL amp                                |
| 99      | AVCC         | I   | AN5V                                   |
| 100     | CTL GAIN     | O   | CTL gain adjustment                    |

## SECTION 7 ADJUSTMENTS

### 7-1 MECHANICAL ADJUSTMENTS

For the mechanical adjustments, please refer to the "VHS MECHANICAL ADJUSTMENT MANUAL IV (H MECHANISM)" (9-973-623-11).

### 7-2. ELECTRICAL ADJUSTMENTS

See the adjusting part location diagram from on page 7-8 for the adjustment.

#### 2-1. PREPARATION BEFORE ADJUSTMENT

##### 2-1-1. Equipment Required

The measuring instruments used for this alignment include:

- 1) Monitor TV
- 2) Oscilloscope, dual-trace, bandwidth of 30MHz or more, with delay mode (A probe 10:1 should be used unless otherwise specified.)
- 3) Frequency counter
- 4) Pattern generator
- 5) Digital voltmeter
- 6) Audio generator
- 7) Audio level meter
- 8) Audio distortion meter
- 9) Audio attenuator
- 10) Alignment tapes  
KRV-51N2 Part No. : 8-192-605-32

##### 2-1-2. Equipment Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

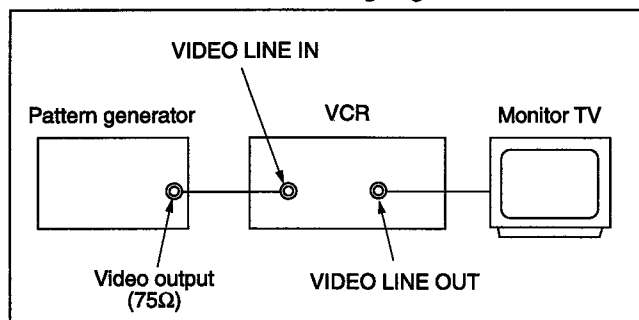


Fig. 7-2-1.

##### 2-1-3. Input Signal Check

Video signal produced by a pattern generator is used as an adjustment signal to perform electrical alignment for this unit. This video signal must satisfy the specification.

Unless otherwise specified, place the switches and controls of this unit in the following positions:

- **CHANNEL** switch ..... LINE

Connect an oscilloscope to the Video Input terminal. Check that the synchronizing signal of the Y signal has an amplitude of approximately 0.7V and that the burst signal has an amplitude of approximately 0.3V and its waveform is flat. And check that the level ratio of burst signal to "red" signal is 0.30 : 0.66. The video signal (color bar) used for electrical aligning this unit is shown in Fig. 7-2-2.

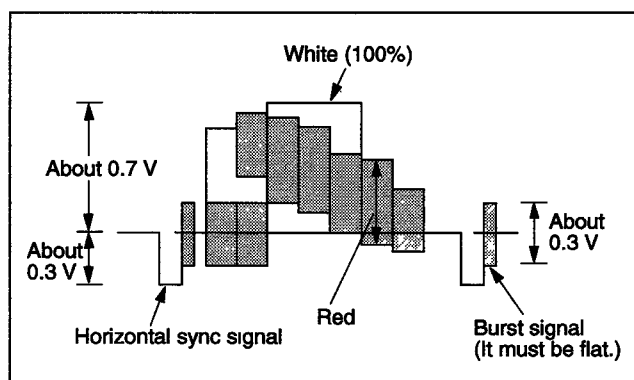


Fig. 7-2-2. Color Bar Signals of Pattern Generator

##### 2-1-4. Alignment Tape

- Contents of KRV-51N2

|   | Mode | Period    | Video signal | Audio signal |        |
|---|------|-----------|--------------|--------------|--------|
|   |      |           |              | Hi-Fi        | Normal |
| 1 | SP   | 7 minutes | Color bar    | 400Hz        | 400Hz  |
| 2 |      | 3 minutes | Monoscope    |              |        |
| 3 | EP   | 7 minutes | Color bar    |              |        |
| 4 |      | 3 minutes | Monoscope    |              |        |

### 2-1-5. Input/Output Levels and Impedance

Video input: LINE IN  
(phone jack) (1)  
Input signal: 1Vp-p, 75ohms, unbalanced, sync negative

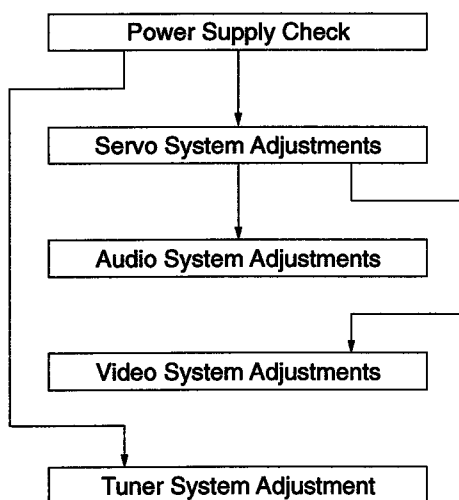
Video output: LINE OUT  
(phone jack) (1)  
Output signal: 1Vp-p, 75ohms, unbalanced, sync negative

Audio input: LINE IN  
(phone jack) (1 : Monaural, 2 : Stereo)  
Input level: -7.5 dBs  
(0dBs= 0.775Vrms)  
Input impedance: more than 47 kilohms

Audio output: LINE OUT  
(phone jack) (1 : Monaural, 2 : Stereo)  
Standard level: -7.5dBs at load impedance 47 kilohms  
Output impedance: less than 10 kilohms

### 2-1-6. Adjustment Sequence

The adjustments should be performed in the following sequence.



## 2-2. POWER SUPPLY CHECK

### 2-2-1. Output Voltage Check (MA-289 Board)

|                      |                   |
|----------------------|-------------------|
| Mode                 | E-E               |
| Measuring Instrument | Digital voltmeter |
| SW 12V Check         |                   |
| Measurement point    | IC600 pin ②       |
| Specified value      | 12.0 ± 0.3V       |
| MTR12V Check         |                   |
| Measurement point    | D600 cathode      |
| Specified value      | 12.4 ± 1.0V       |
| SW5V Check           |                   |
| Measurement point    | Q602 emitter      |
| Specified value      | 5.1 ± 0.2Vdc      |
| D5V Check            |                   |
| Measurement point    | D161 cathode      |
| Specified value      | 5.1 ± 0.3V        |

#### [Check Method]

- 1) Each of these supply voltages must meet its specified value.

### 2-3. SERVO SYSTEM CHECK

Unless otherwise specified, set the switches to the following positions.

- **CHANNEL** switch ..... LINE
- **TAPE SPEED** switch ..... SP

#### 2-3-1. RF Switching Position Adjustment (MA-289 Board)

##### [Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

| Mode                 | Playback                                                  |
|----------------------|-----------------------------------------------------------|
| Signal               | Alignment tape: SP color bar portion                      |
| Measurement point    | CH1: Video LINE OUT terminal<br>CH2: CN261 pin ③ (RF SWP) |
| Measuring instrument | Oscilloscope                                              |
| Specified value      | $6.5 \pm 0.5H$ ( $410 \pm 32 \mu\text{sec}$ )             |

##### [Adjustment Method]

- 1) Short-circuit between JS401 and ground on MA-289 board for about 1 second to activate the RF switching position adjustment mode.
- 2) Check that "ADJ" is indicated on FL display.
- 3) Using the channel + and - buttons, adjust to  $410 \pm 32 \mu\text{sec}$  ( $6.5 \pm 0.5H$ ).
- 4) Press the PAUSE button.
- 5) Press the EJECT button.

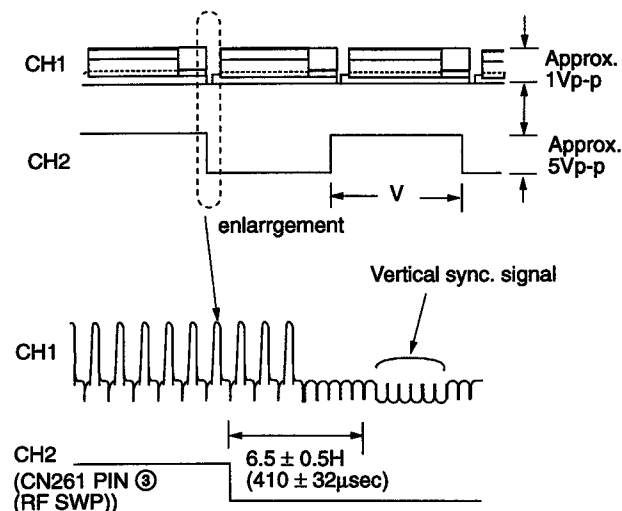


Fig. 7-2-3.

### 2-4. VIDEO SYSTEM CHECKS

For the video system checks, follow the checking procedures given below as a rule. The color bar video signal supplied from the pattern generator is used as the video input signal for the video system adjustment of the recording mode. Check that the signal satisfies the specified value designated in the "Check of input signal" (Fig. 7-2-2)

Unless otherwise specified, set the switches to the following positions.

- **CHANNEL** switch ..... LINE
- **TAPE SPEED** switch ..... SP

##### [Checking Sequence]

- 1) X'tal OSC Check
- 2) SYNC AGC Check
- 3) White clip/Dark clip Check
- 4) Recording Y Level Check
- 5) Recording Chroma Level Check
- 6) Playback Level Check

#### 2-4-1. X'tal OSC Check (MA-289 Board)

| Mode                 | Playback                             |
|----------------------|--------------------------------------|
| Signal               | Alignment tape: SP Color bar portion |
| Measurement point    | IC201 pin ⑤                          |
| Measuring instrument | Oscilloscope and Frequency counter   |
| Specified value      | $3,579,545 \pm 70\text{Hz}$          |

**Note:** A frequency counter should be connected through a buffer amplifier (oscilloscope, etc.) having a high impedance and a low capacitance.

##### [Check Method]

- 1) Check that the oscillation frequency satisfies the specified value and that the oscillation voltage is  $450 \pm 200\text{mVp-p}$ .

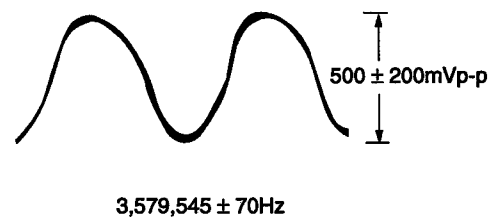


Fig. 7-2-4.

#### 2-4-2. SYNC AGC Check (MA-289 Board)

|                      |                                                                 |
|----------------------|-----------------------------------------------------------------|
| Mode                 | E-E                                                             |
| Signal               | Color bar                                                       |
| Measurement point    | Video LINE OUT terminal                                         |
| Measuring instrument | Oscilloscope                                                    |
| Specified value      | $A=1.00 \pm 0.05\text{V}_{\text{p-p}}$ (75 $\Omega$ terminated) |

##### [Check Method]

- 1) Check that the Video signal level (A) satisfies the specified value.

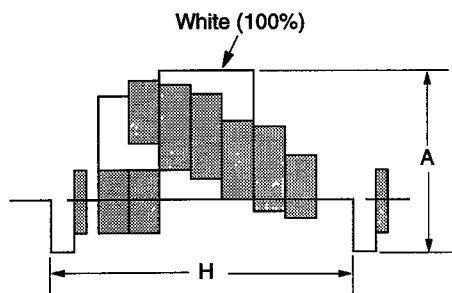


Fig. 7-2-5.

#### 2-4-3. White Clip/Dark Clip Check (MA-289 Board)

|                      |                                                        |
|----------------------|--------------------------------------------------------|
| Mode                 | E-E                                                    |
| Signal               | Color bar                                              |
| Measurement point    | IC201 pin ⑭                                            |
| Measuring instrument | Oscilloscope                                           |
| Specified value      | White clip: $190 \pm 15\%$<br>Dark clip: $50 \pm 10\%$ |

##### [Check Method]

- 1) Check that the white clip level is  $190 \pm 15\%$  to the white (100%) level.
- 2) Check that the dark chip level is  $50 \pm 10\%$  to the white (100%) level.

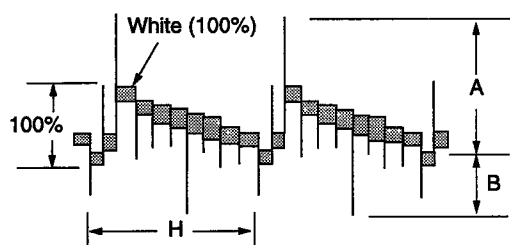


Fig. 7-2-6.

#### 2-4-4. Recording Y Level Check (MA-289 Board)

|                      |                  |
|----------------------|------------------|
| Mode                 | E-E              |
| Signal               | No-signal        |
| Measurement point    | IC201 pin ⑮      |
| Measuring instrument | Oscilloscope     |
| Specified value      | $A=320\text{mV}$ |

##### [Check Method]

- 1) Check that the recording RF signal satisfies the specified value.

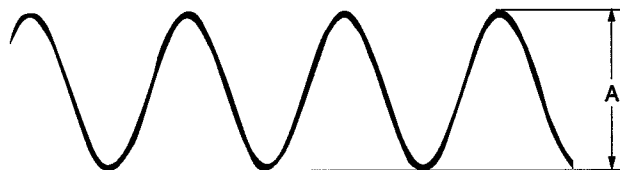


Fig. 7-2-7.

#### 2-4-5. Recording Chroma Level Check (MA-289 Board)

|                      |                         |
|----------------------|-------------------------|
| Mode                 | Recording               |
| Signal               | Color bar               |
| Measurement point    | IC201 pin ⑮             |
| Measuring instrument | Oscilloscope            |
| Specified value      | $A=380 \pm 40\text{mV}$ |

##### [Check Method]

- 1) Confirm the amplitude of recording chroma level becomes the specified value.

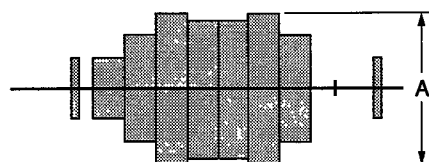


Fig. 7-2-8.

## 2-4-6. Playback Level Check (MA-289 Board)

|                      |                                                   |
|----------------------|---------------------------------------------------|
| Mode                 | Playback                                          |
| Signal Alignment     | Tape: SP mode color bar portion                   |
| Measurement point    | Video LINE OUT terminal                           |
| Measuring instrument | Oscilloscope                                      |
| Specified value      | $A=1.00 \pm 0.02V_{p-p}$ (75 $\Omega$ terminated) |

### [Check Method]

- 1) Check that the playback level satisfies the specified value.

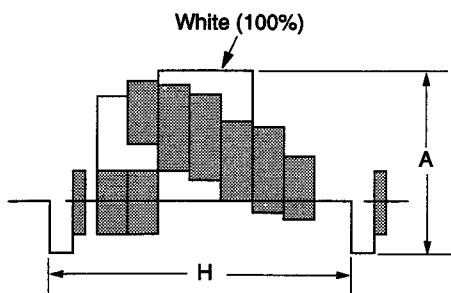


Fig. 7-2-9.

## 2-5. AUDIO SYSTEM ADJUSTMENT

- For the adjustment of the audio system, perform in the SP mode if there is no special notes. Use the alignment tape.
- Adjust both L-CH and R-CH (SLV-675HF/676HF/685HF/695HF/L60HF/L70HF/X6HF).

### [Connecting Instruments]

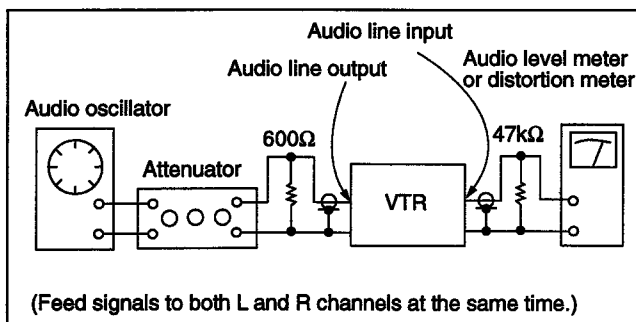


Fig. 7-2-10.

- Hi-Fi Audio System Adjustment (SLV-675HF/676HF/685HF/695HF/L60HF/L70HF/X6HF)

Perform the adjustment setting the switches and controls on the following positions if there is no special indications.

- **CHANNEL** switch ..... LINE
- **CHANNEL** switch ..... ON \*1)
- **TAPE SPEED** switch ..... SP \*1)

\*1) Set by remote commander

## 2-5-1. AF Switching Position Adjustment (MA-289 Board)

### [Adjustment purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. If this specification is not satisfied, the noise will increase and cracking sounds will be produced.

|                      |                                                        |
|----------------------|--------------------------------------------------------|
| Mode                 | Playback                                               |
| Signal               | Alignment tape: SP color bar portion                   |
| Measurement point    | CH1: CN341 pin ① (AF ADJ)<br>CH2: CN261 pin ③ (RF SWP) |
| Measuring instrument | Oscilloscope                                           |
| Specified value      | No dropouts in the RF signal                           |

### [Adjustment Method]

- 1) Short-circuit between JS401 and ground on MA-289 board for about 1 second to activate the RF switching position adjustment mode.
- 2) Check that "ADJ" is indicated on FL display.
- 3) Press the REC button to activate the AF switching position adjustment mode.
- 4) Using the channel + and - buttons, minimize a chipped portion. At this time, confirm that a noisy sound is not heard.
- 5) Press the PAUSE button.
- 6) Press the EJECT button TAPE SPEED

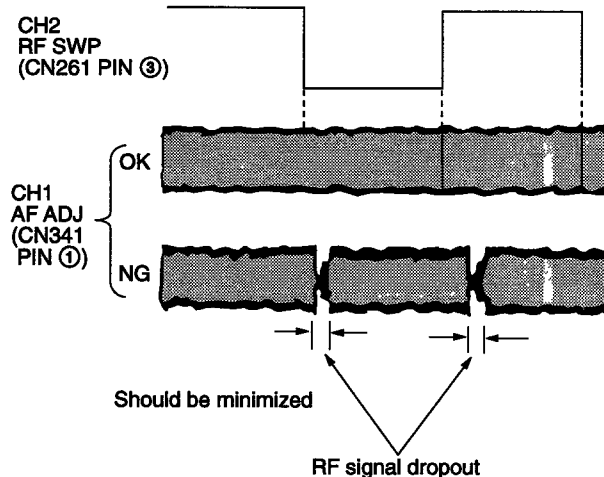


Fig. 6-2-11.

- Normal Audio System Adjustment
- Adjust in the SP mode if there is no special indications.
- Perform the adjustment setting the switch on the following positions.

- **CHANNEL** switch ..... LINE
  - **AUTO STEREO** switch ..... OFF \*1
- \*1) Set by remote commander. (SLV-675HF/676HF/685HF/695HF/L60HF/L70HF/X6HF)

#### [Adjustment Method]

1. ACE head adjustment.....Refer to the VHS mechanical adjustment manual IV.
2. E-E output level check
3. Overall Output level and distortion factor check
4. Overall noise level check.

### 2-5-2. ACE Head Adjustment

Refer to the "VHS mechanical adjustment manual IV" (9-973-623-11).

### 2-5-3. E-E Output Level Check

|                      |                               |
|----------------------|-------------------------------|
| Mode                 | E-E                           |
| Signal               | 400Hz, -7.5dBs: Audio LINE IN |
| Measurement point    | Audio LINE OUT terminal       |
| Measuring instrument | Audio level meter             |
| Specified value      | -7.5 ± 2dBs                   |

#### [Check Method]

- 1) Input signal of 400Hz and -7.5dBs to the audio input.
- 2) Check that the audio output level is -7.5 ± 2dBs.

### 2-5-4. Overall Output Level and Distortion Factor Check

|                      |                                                         |
|----------------------|---------------------------------------------------------|
| Mode                 | Self-record playback                                    |
| Signal               | 400Hz, -7.5dBs: Audio LINE IN                           |
| Measurement point    | Audio LINE OUT terminal                                 |
| Measuring instrument | Audio level meter and Distortion meter                  |
| Specified value      | Playback Level: -7.5 ± 3dBs<br>Distortion: 4.0% or less |

#### [Check Method]

- 1) Input signal of 400Hz and -7.5dBs to the audio input.
- 2) Record signal.
- 3) Playback the recorded portion.
- 4) Check that the output level is -7.5 ± 3dBs.
- 5) Check that the distortion factor is 4.0% or less.

### 2-5-5. Overall Noise Level Check

|                      |                                                                    |
|----------------------|--------------------------------------------------------------------|
| Mode                 | Self-record playback                                               |
| Signal               | No signal (Insert a shorting plug into the Audio LINE IN terminal) |
| Measurement point    | Audio LINE OUT terminal                                            |
| Measuring instrument | Audio level meter (IHF-A weighing filter is used)                  |
| Specified value      | - 46dBs or less                                                    |

#### [Check Method]

- 1) Record.
- 2) Playback recorded portion.
- 3) Check that noise level is - 46dBs or less.

## 2-6. TUNER SYSTEM ADJUSTMENT

### 2-6-1. Separation Adjustment (MA-289 Board)

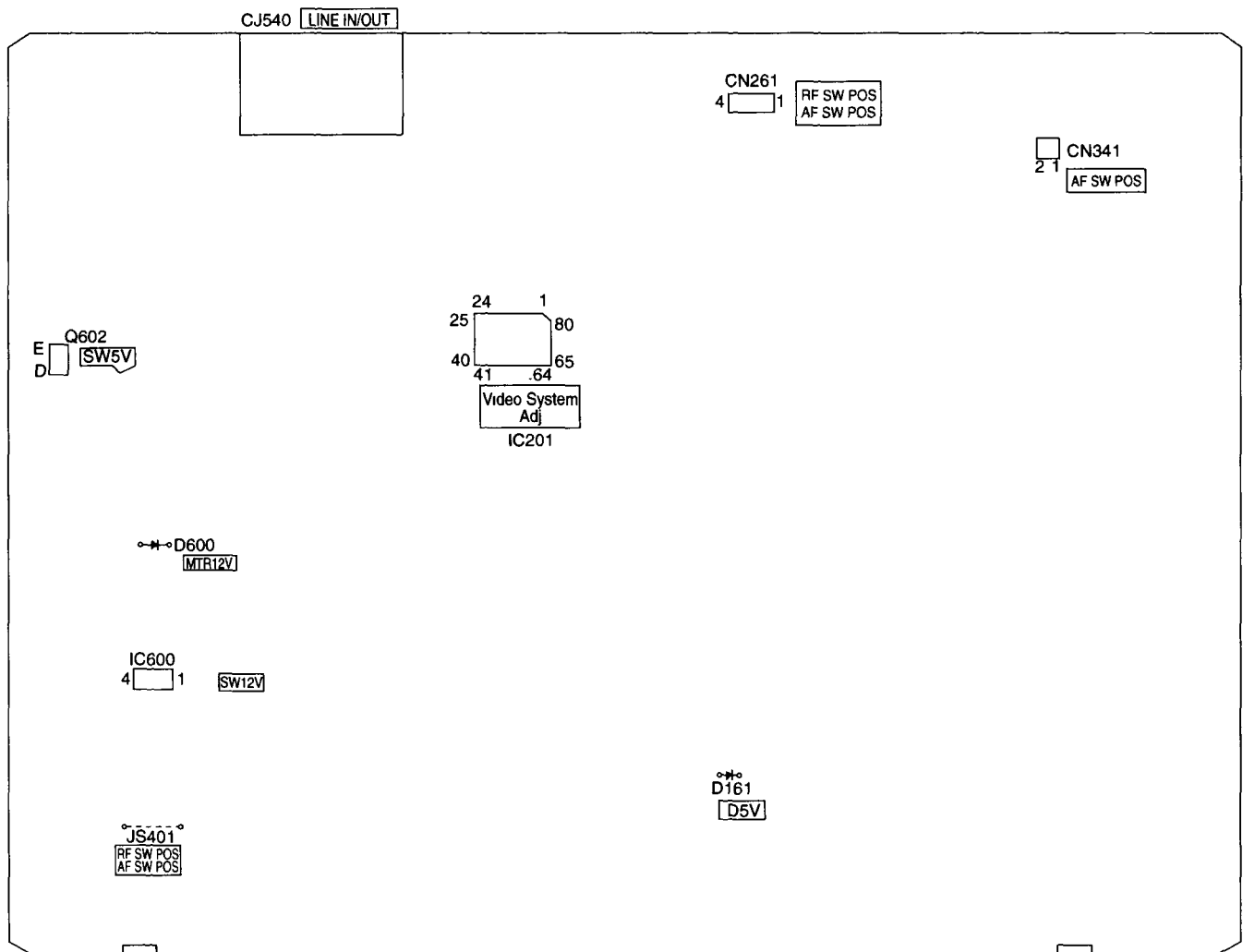
|                      |                                                                                                                                                      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mode                 | E-E                                                                                                                                                  |
| Signal               | RF signal<br>(Video : Color bar (100%)<br>white modulation<br>Audio : Mono 400Hz<br>100% modulation<br>Electrical field:<br>60-80dBm/75Ω terminated) |
| Measuring instrument | Audio level meter                                                                                                                                    |
| Measuring point      | IC733 pin ⑫ (MPX IN)                                                                                                                                 |
| Adjusting element    | RV731                                                                                                                                                |
| Specified value      | - 9.9 ± 0.1dbm                                                                                                                                       |

#### [Adjustment Method]

- 1) Feed the RF signal from RF IN terminal.
- 2) Adjust with RV731 so that the output level satisfies the specified value.

2-7. ADJUSTMENT PARTS LOCATION DIAGRAM

MA-289 BOARD (CONDUCTOR SIDE)

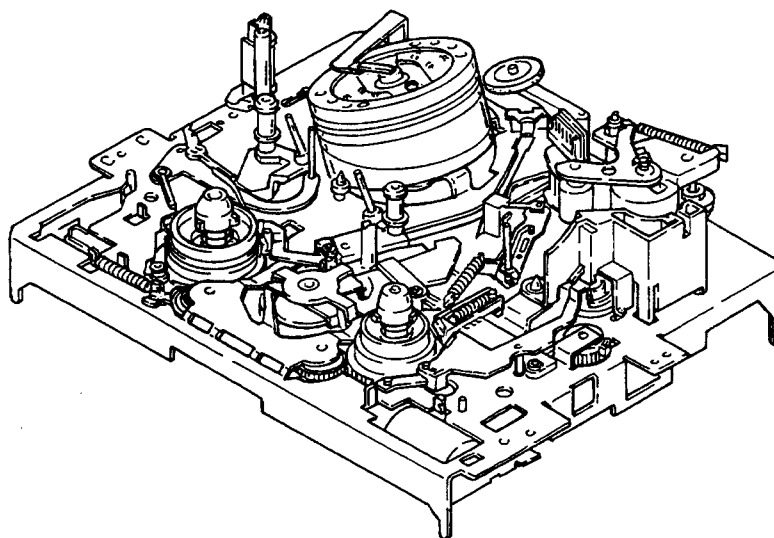
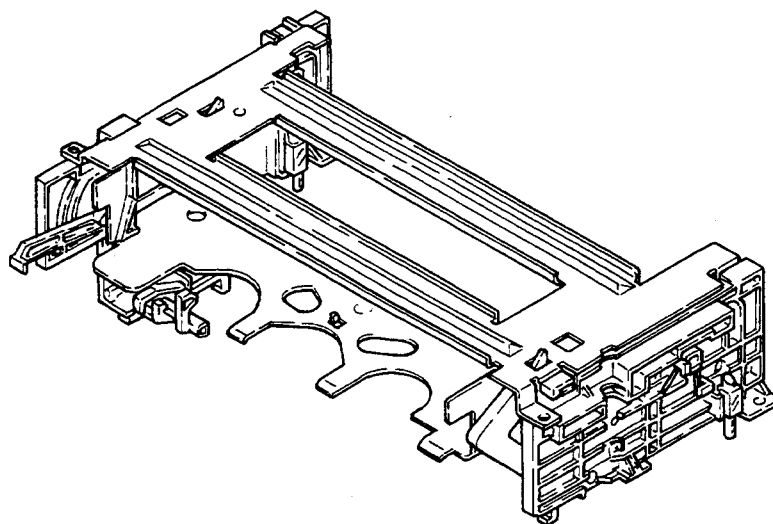


# VHS MECHANICAL ADJUSTMENT MANUAL IV

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## H MECHANISM

Please use with the service manual.



VHS VIDEO CASSETTE RECORDER  
**SONY**®

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## 1. PREPARATION FOR MECHANISM CHECK ADJUSTMENT AND REPLACEMENT

Refer to the service manual, "DISASSEMBLY" for removal of the cabinet and boards.

### 1-1. LOADING AND THREADING PROCEDURE WHEN THE POWER TURNS OFF (Fig. 1-1)

#### 1-1-1. LOADING AND THREADING PROCEDURE WITH HANDS

- 1) Turn cam motor in the arrow **A** direction until loading and threading are end.

#### 1-1-2. LOADING AND THREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

- 1) Applying approx. +9 V (300 mA) to cam motor with regulated DC power supply makes it loading and threading.

**Note:** When loading and threading without cassette, claws are caught in four positions as following figure (in the order ① → ② → ③ → ④).  
So release them with hands.

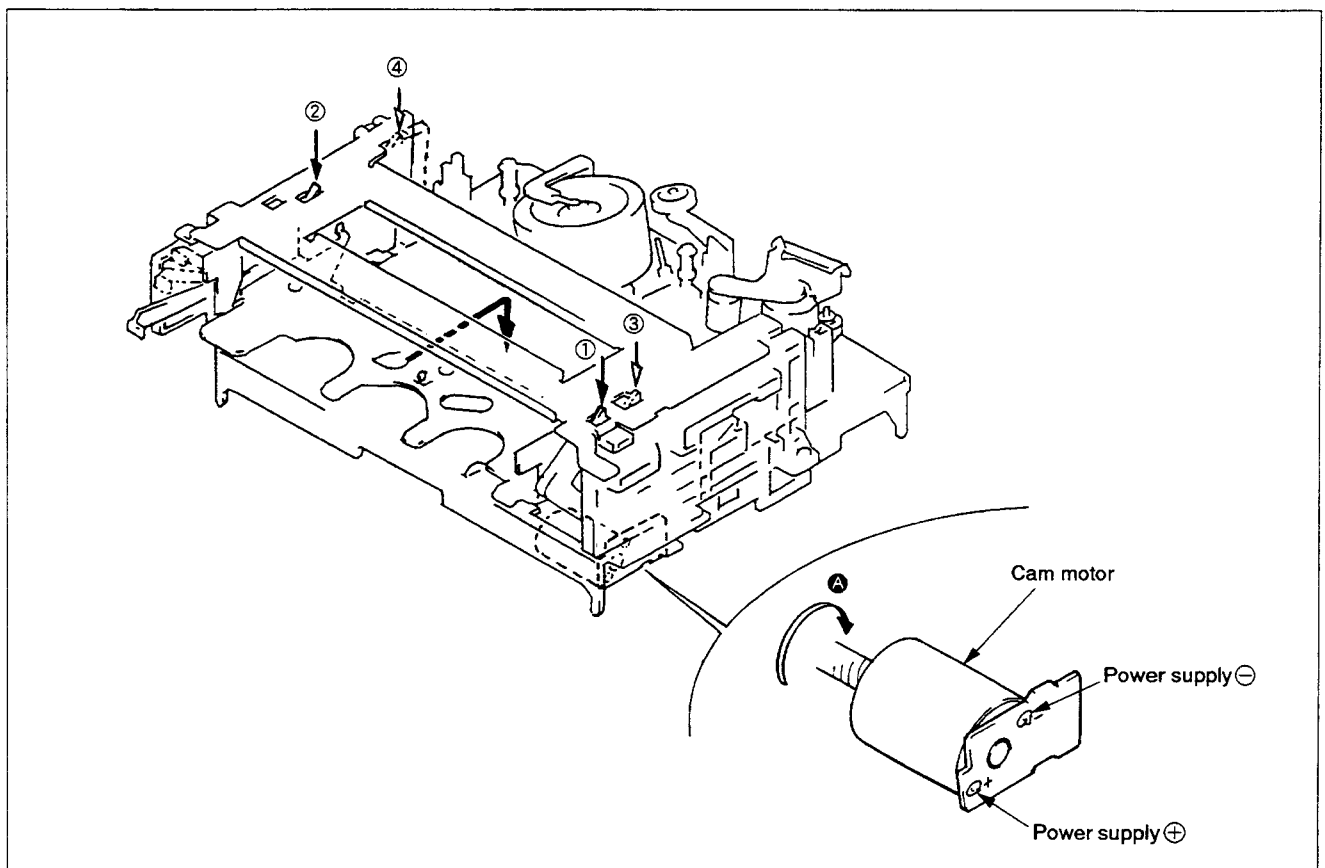


Fig. 1-1

**1-2. UNLOADING AND UNTHREADING PROCEDURE WHEN THE POWER TURNS OFF (Figs. 1-2 and 1-3)**

**1-2-1. UNLOADING AND UNTHREADING PROCEDURE WITH HANDS**

- 1) Turn cam motor in the arrow **B** direction until unthreading is end.
- 2) Turn capstan motor in the arrow **C** direction to take up tape in cassette.
- 3) Turn cam motor in the arrow **B** direction until unloading is end.

**1-2-2. UNLOADING AND UNTHREADING PROCEDURE WITH REGULATED DC POWER SUPPLY**

- 1) Apply approx. +9 V (300 mA) to contrary polarities of cam motor.
- 2) Unthreading operation begins, tape guides return to their original positions (Unthreading operation is end but tape remains), then stop cam motor by turning power off.

**Note:** When unloading begins and cassette lid is closed, turn cam motor in the arrow **A** direction to open tape guard.

- 3) Turn capstan motor in the arrow **C** direction to take up tape in cassette.

**Note:** That tape is not caught at pinch roller. (Fig. 1-3)

- 4) Check that tape is not loosened completely, and apply approx. +9 V (300 mA) to contrary polarities of cam motor with regulated DC power supply. (Fig. 1-2)

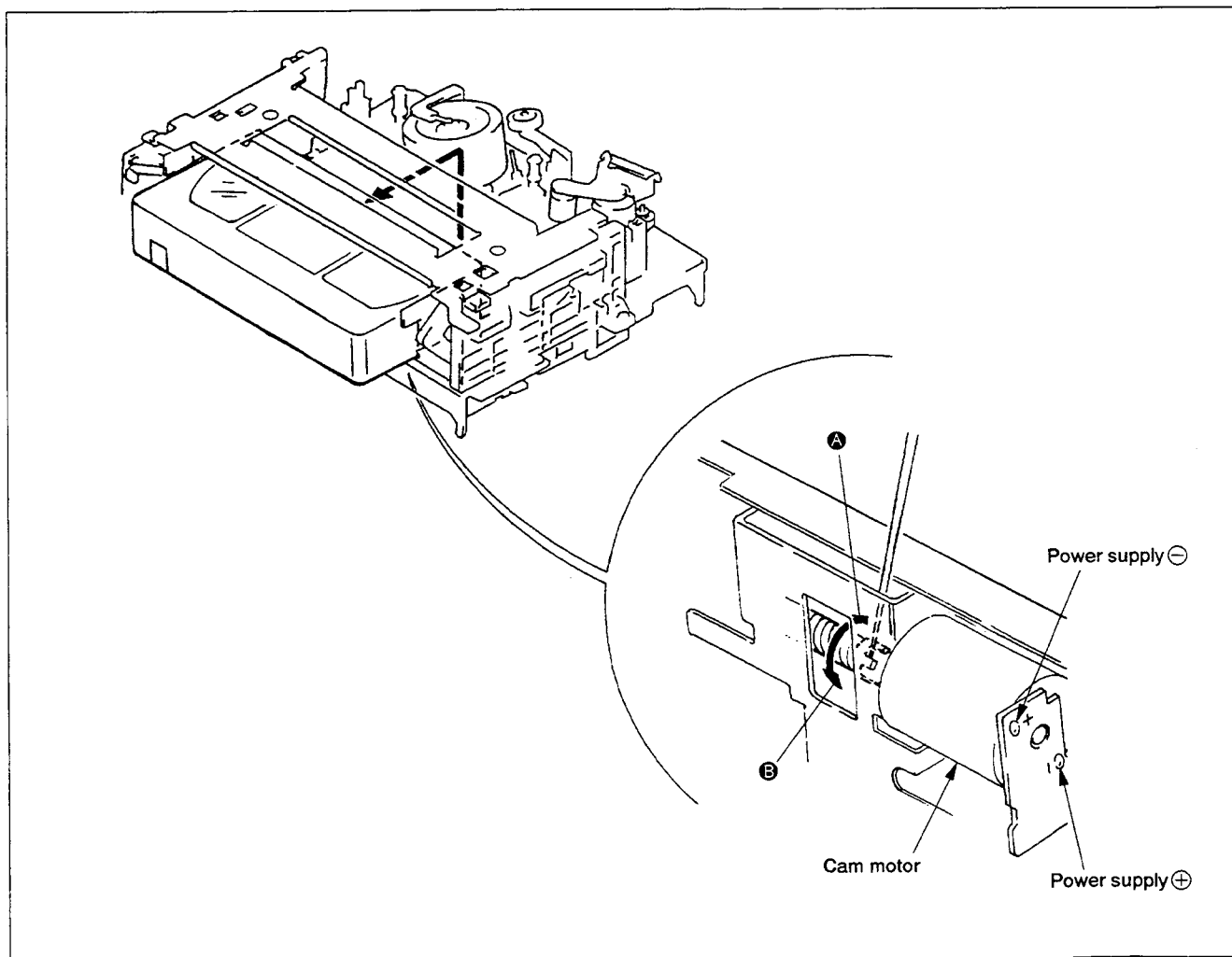


Fig. 1-2

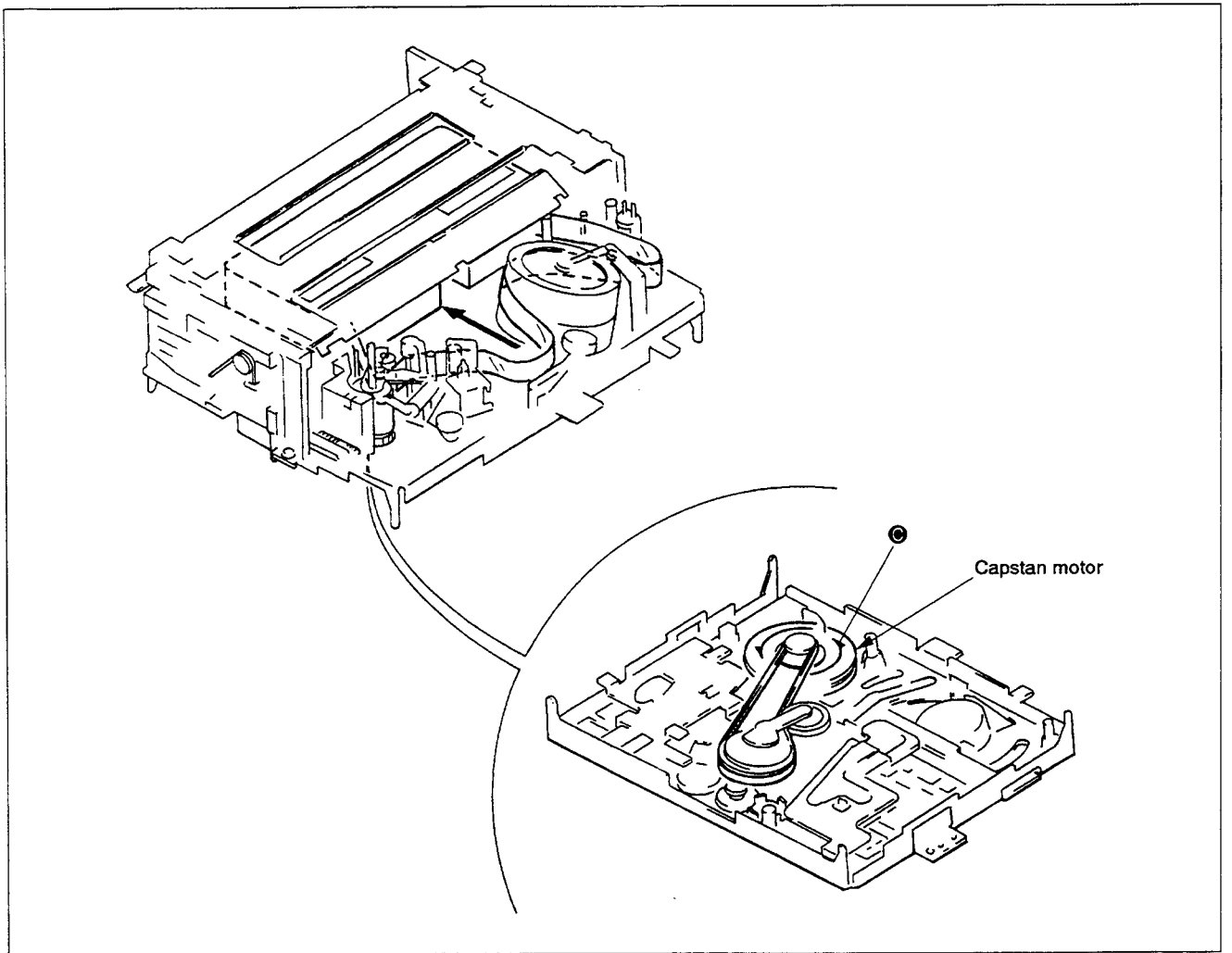


Fig. 1-3

### 1-3. HOW TO COMPLETE THREADING WITHOUT CASSETTE COMPARTMENT (Fig. 1-4)

**Note 1:** Put the FL block assembly removed the FL top plate on the bottom not to put dust or grease the top sensor and the end sensor luminous plates or not to scratch them.  
(Fig. A)

- 1) Pull out AC plug from wall outlet.
- 2) Shade near the end and top sensors with a black masking tape on the like.
- 3) Press cassette in/rec proof switch with a tip of screwdriver or the like.
- 4) Connect AC plug to wall outlet.
- 5) Release cassette in/rec proof switch by putting off a tip of screwdriver or the like.

(At this time, power turns on, rewind operates for 10 seconds, after that power turns off.)

**Note 2:** In this condition, each mode can be set to video cassette recorder. (including recording mode)  
However, fast forward should be done after rewinding for 15 seconds or more.

**Note 3:** After above mentioned operation, be sure to return the mode in the following order.

- 1) Remove the tape near the end and top sensors.
- 2) Pull out AC plug from wall outlet to reset the system control microcomputer.

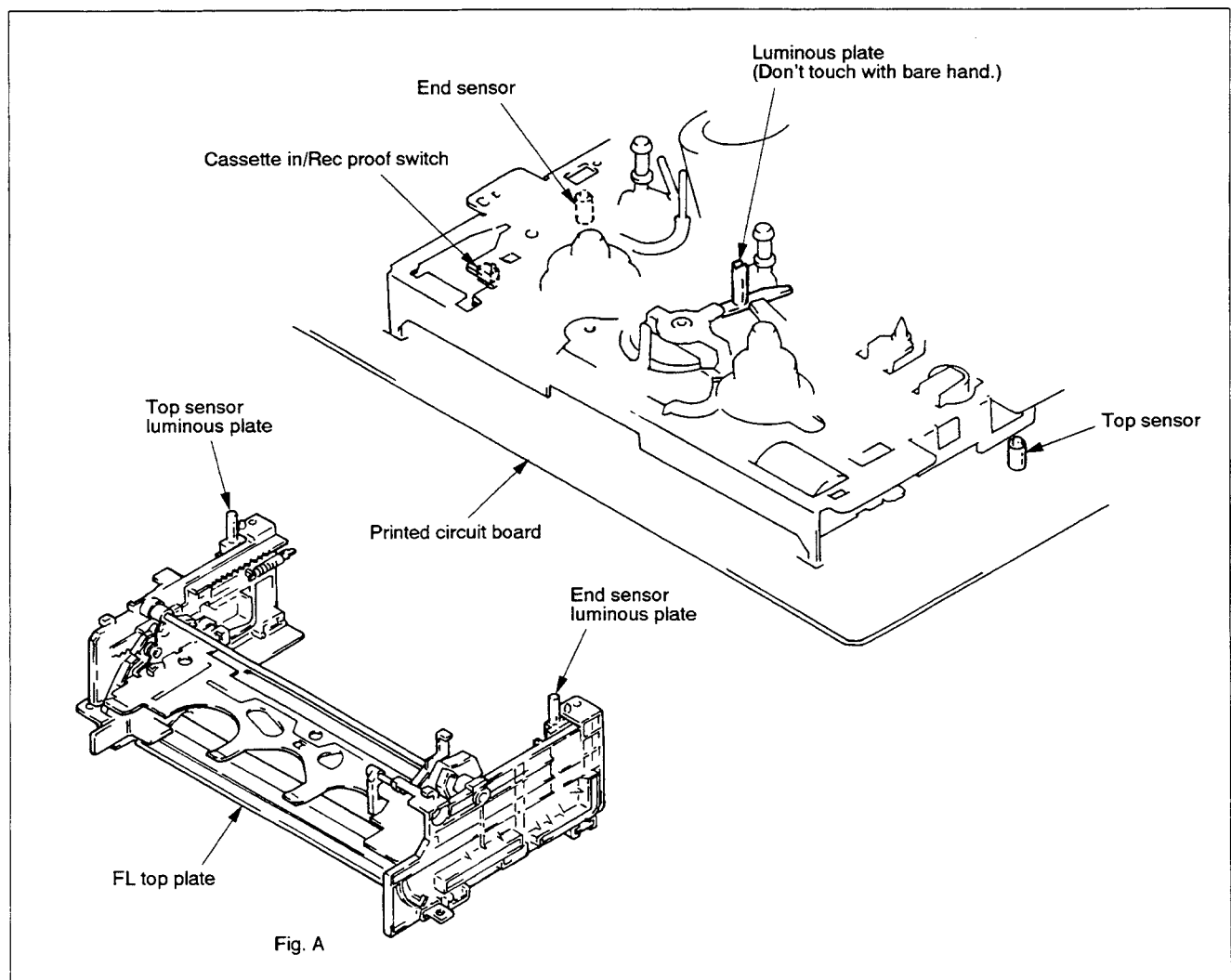


Fig. 1-4

## 2. PERIODIC CHECK AND REPLACEMENT

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

\* The following must be done after every repair regardless of how many hours the user has operated the machine.

### 2-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

- 1) Press a chamois cloth (Jig Ref. No. J-9) which has been dipped in cleaning fluid (Jig Ref. No. J-8) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
- 2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

### 2-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

- 1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

### 2-3. CLEANING THE DRIVE SYSTEM

- 1) Clean the driving parts with a cloth that been dipped in cleaning fluid.

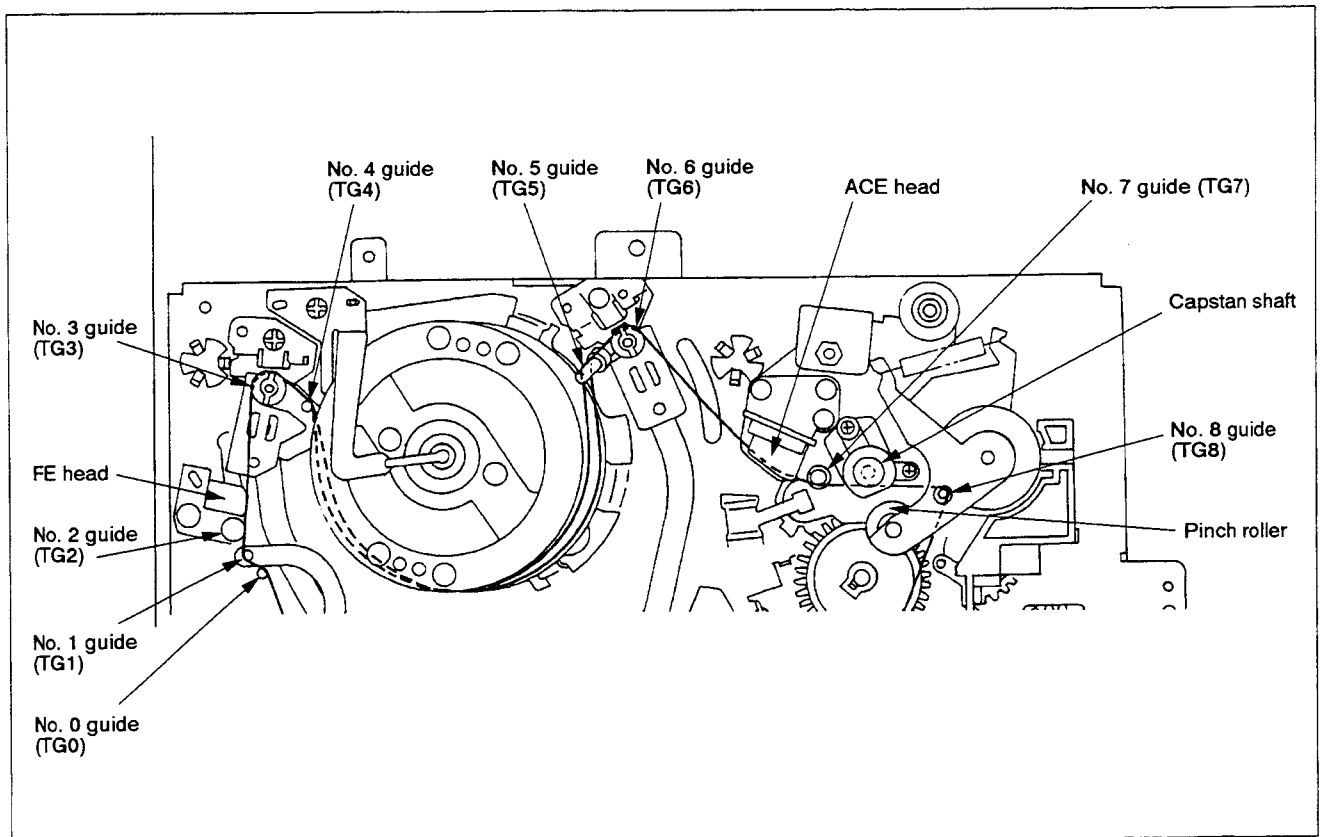


Fig. 2-1 Parts requiring cleaning

## 2-4. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below,  
according to users operating hours.

| Operating Hours (H)        |                                              | 500 | 1,000 | 1,500 | 2,000 | 2,500 | 3,000 | 3,500 | 4,000 | 4,500 | 5,000 | Remarks                                                                                                                                |
|----------------------------|----------------------------------------------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------------------------------------------------------------------------------------------------------------------|
| Maintenance & Check        |                                              |     |       |       |       |       |       |       |       |       |       |                                                                                                                                        |
| Tape Transportation System | Cleaning of tape transportation system       | ○   | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ○     | This cleaning must be done whenever a repair is made.                                                                                  |
|                            | Cleaning and degaussing of ACE assembly      | ○   | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ○     |                                                                                                                                        |
|                            | Cleaning & degaussing of upper drum assembly | ○   | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ○     | ○     | The life of the head varies, depending on operational conditions and method.                                                           |
| Performance Confirmation   | Abnormal sound                               | ☆   | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | Adjust or replace the section which causes abnormal sound.                                                                             |
|                            | Measurement of FWD back tension              | —   | ☆     | —     | ☆     | —     | ☆     | —     | ☆     | —     | ☆     | Confirmation must be made according to 4-1-1.<br>Specified value:<br>adjust to 36 to 44 g·cm (when measured with torque cassette tape) |
|                            | Confirmation of brake system                 | —   | ☆     | —     | ☆     | —     | ☆     | —     | ☆     | —     | ☆     | Confirmation must be made according to section.                                                                                        |
|                            | Confirmation of record & playback functions  | ☆   | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | Perform the confirmation whenever repair is made.                                                                                      |
|                            | Measurement of forward torque                | ☆   | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | ☆     | Adjust to 70 to 120 g·cm                                                                                                               |

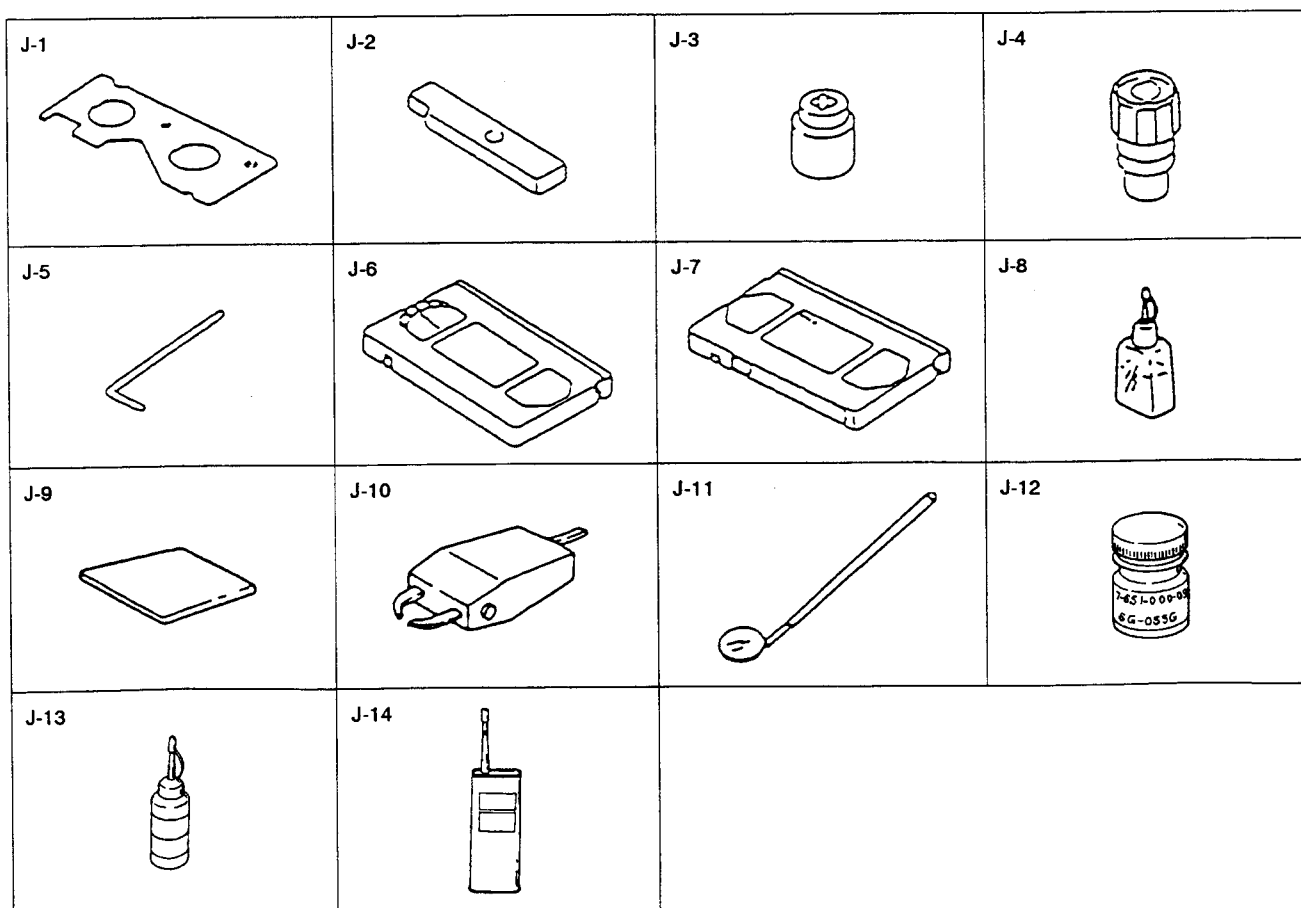
○ Cleaning ☆ Confirmation

**Note:** On overhaul

When overhauling the unit, replace parts as indicated in the above table.

## 2-5. TOOLS AND FIXTURES REQUIRED FOR SERVICING

| Ref No. | Name                                                                                             | Part No.                                                     | Carved Jig No. | Remarks                                             |
|---------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------|-----------------------------------------------------|
| J-1     | Master Plane                                                                                     | H-7099-279-H                                                 |                | Applicable to S-VHS                                 |
| J-2     | Reel Disk Height Jig                                                                             | H-7099-038-H                                                 |                |                                                     |
| J-3     | Torque Gauge Adaptor                                                                             | H-7099-035-H                                                 |                |                                                     |
| J-4     | 0.93 mm Torque Gauge                                                                             | H-7099-039-H                                                 |                |                                                     |
| J-5     | Hex. Wrench                                                                                      | H-7099-202-H                                                 |                |                                                     |
| J-6     | Torque Measurement Cassette VHT-063S                                                             | J-6082-011-A                                                 |                | For FWD & back tension torque measurement.          |
|         | Torque Measurement Cassette VHT-404S                                                             | J-6082-012-A                                                 |                | For CUE and review torque measurement.              |
| J-7     | Alignment Tape<br>JVC-MH-1 (NTSC)<br>24HASF-2 (NTSC Hi-Fi)<br>JVC-MH-2 (PAL)<br>JVC-MH-4 (SECAM) | H-7099-046-H<br>H-7099-153-H<br>H-7099-052-H<br>H-7099-053-H |                |                                                     |
| J-8     | Cleaning Fluid                                                                                   | Y-2031-001-0                                                 | _____          |                                                     |
| J-9     | Chamois Leather                                                                                  | 2-034-697-00                                                 | _____          |                                                     |
| J-10    | Head Demagnetizer                                                                                | Widely available                                             | _____          | Demagnetize video heads and audio heads.            |
| J-11    | Dental Mirror (With handle)<br>Dental Mirror (Mirror)                                            | J-6080-029-A<br>J-6080-030-1                                 | SL-5052        | Tape path and tape traveling adjustments or checks. |
| J-12    | FLOIL SG-055G                                                                                    | 7-651-000-09                                                 |                |                                                     |
| J-13    | Diamond Oil NT-68                                                                                | 7-661-018-18                                                 |                |                                                     |
| J-14    | Screw Lock G (1401B)                                                                             | 7-432-114-11                                                 |                |                                                     |



### 3. MAINLY MECHANICAL PARTS REPLACEMENT

#### Notes:

- Refer to the service manual, "DISASSEMBLY" for removal of the cabinet and boards.
- On mounting, while referring to notes on mounting perform reversely in the removal order.
- When replacing greased parts, grease them in the same way.
- Do not oil, grease or touch with bare hands the surfaces contacts tape of guides and brake shoes.
- Install gears to engage each other.
- Basically, disassembling and assembling should be done in the unthreading-end condition.

#### 3-1. FL BLOCK ASSEMBLY (Fig. 3-1)

- 1) Remove screws ①.
- 2) Remove FL block assembly ② in the arrow **A** direction.

**Note:** Be careful not to damage claws on the bottom and front.

#### [Note on Mounting]

- First insert claws on the bottom and front not to damage.
- Engage FL slide plate to FL driving gear with slightly sliding FL slide plate. (Fig. A)
- Keep clean top sensor and end sensor luminous plates. (Refer to 1-3.)

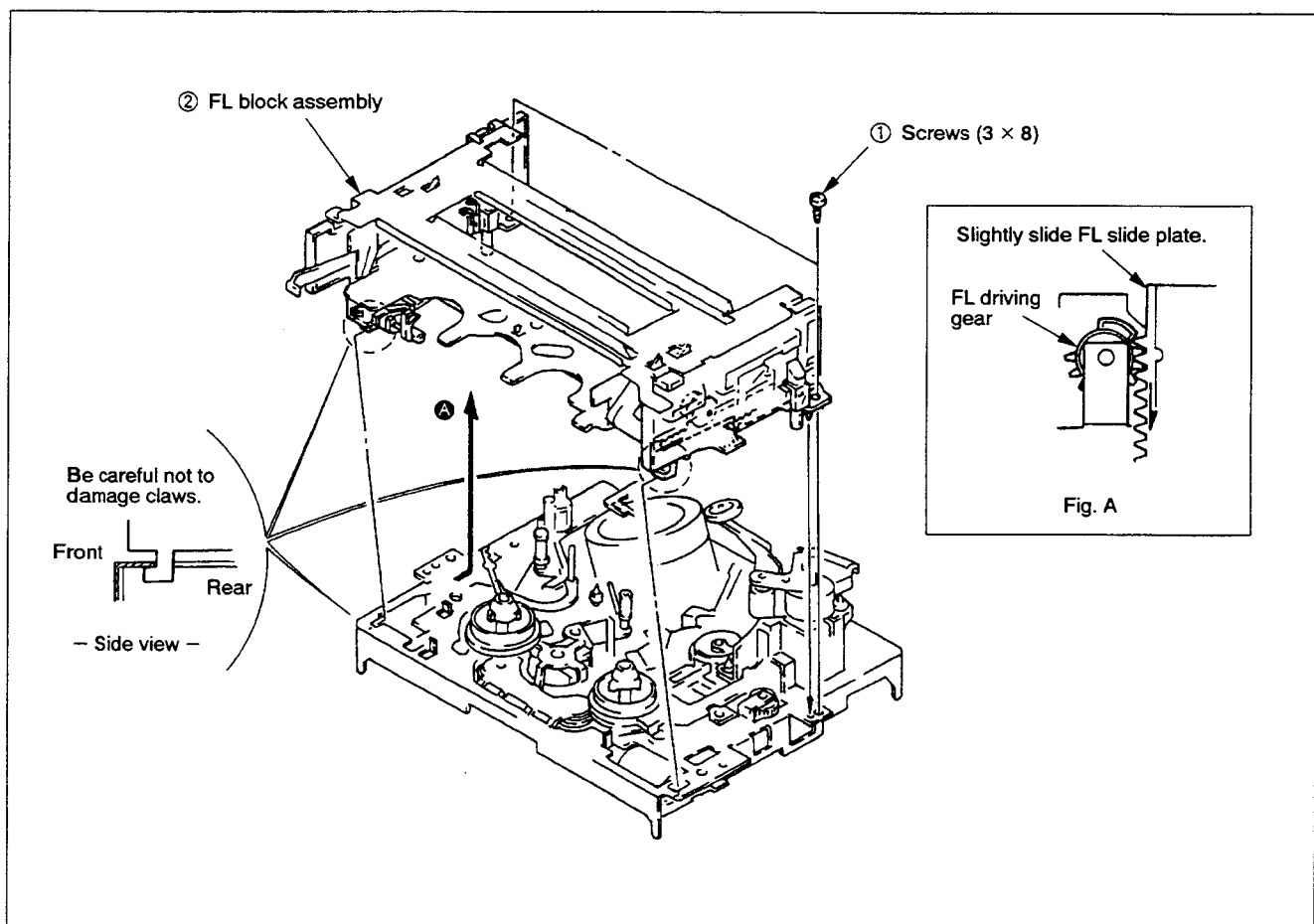


Fig. 3-1

### 3-2. DRUM ASSEMBLY (Fig. 3-2)

- 1) Remove screw ①.
- 2) Remove ground shaft assembly ② not to touch its tip with bare hand or tools.
- 3) Remove screws ③ to remove drum assembly ④.

#### [Note on Mounting]

- Don't touch head chips ⑤ and ground shaft assembly ④ with bare hand or tools.
- Keep clean the surface contacts tape of drum assembly ④.

#### [Adjustment after Mounting]

- 4-1. Tape path adjustment.

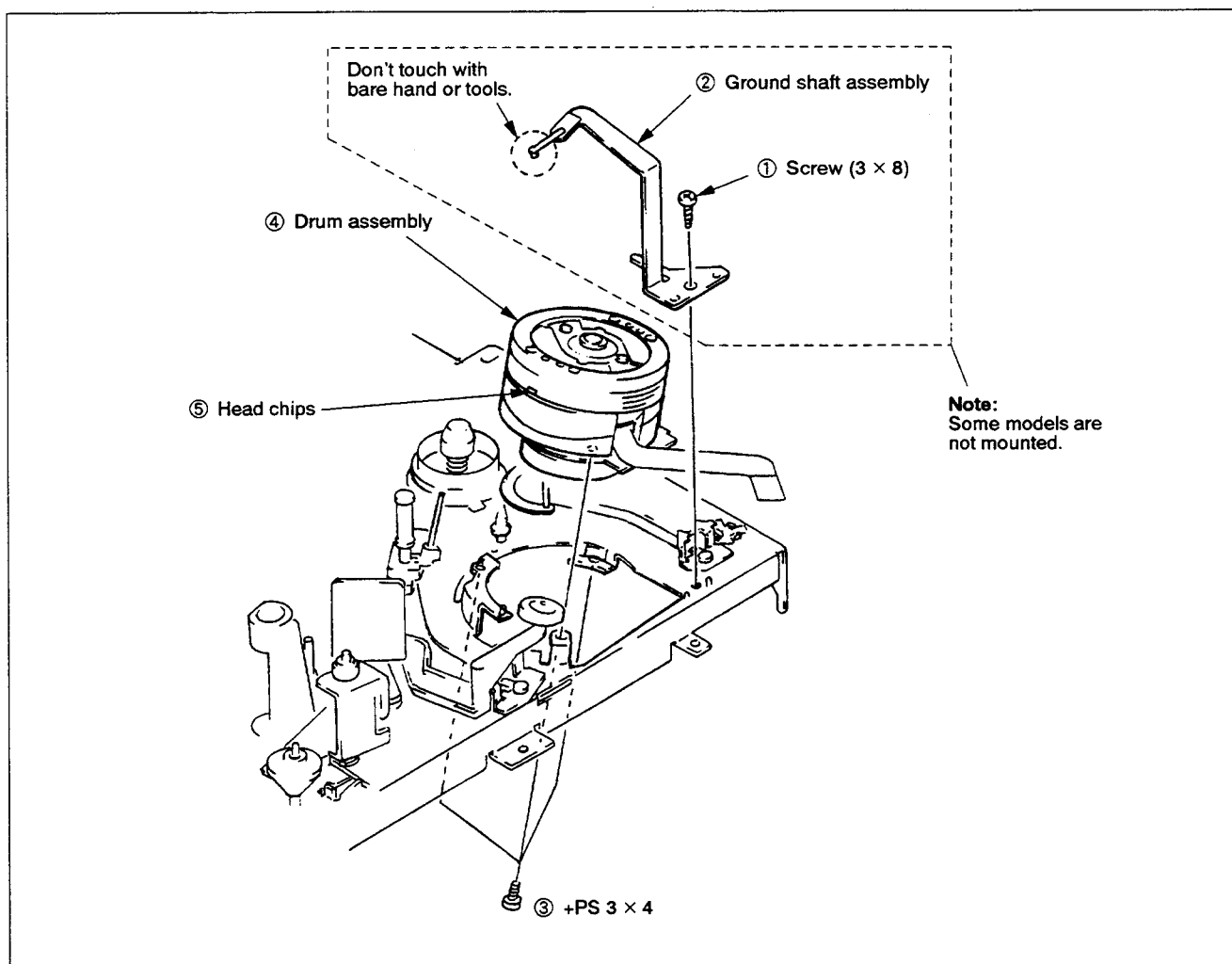


Fig. 3-2

### 3-3. TIMING BELT (Fig. 3-3)

- 1) Remove screw ① to remove tension vehicle arm assembly ②.
- 2) Remove timing belt ③.

#### [Note on Mounting]

- Tighten screw ① while pressing tension vehicle arm in the arrow A direction.

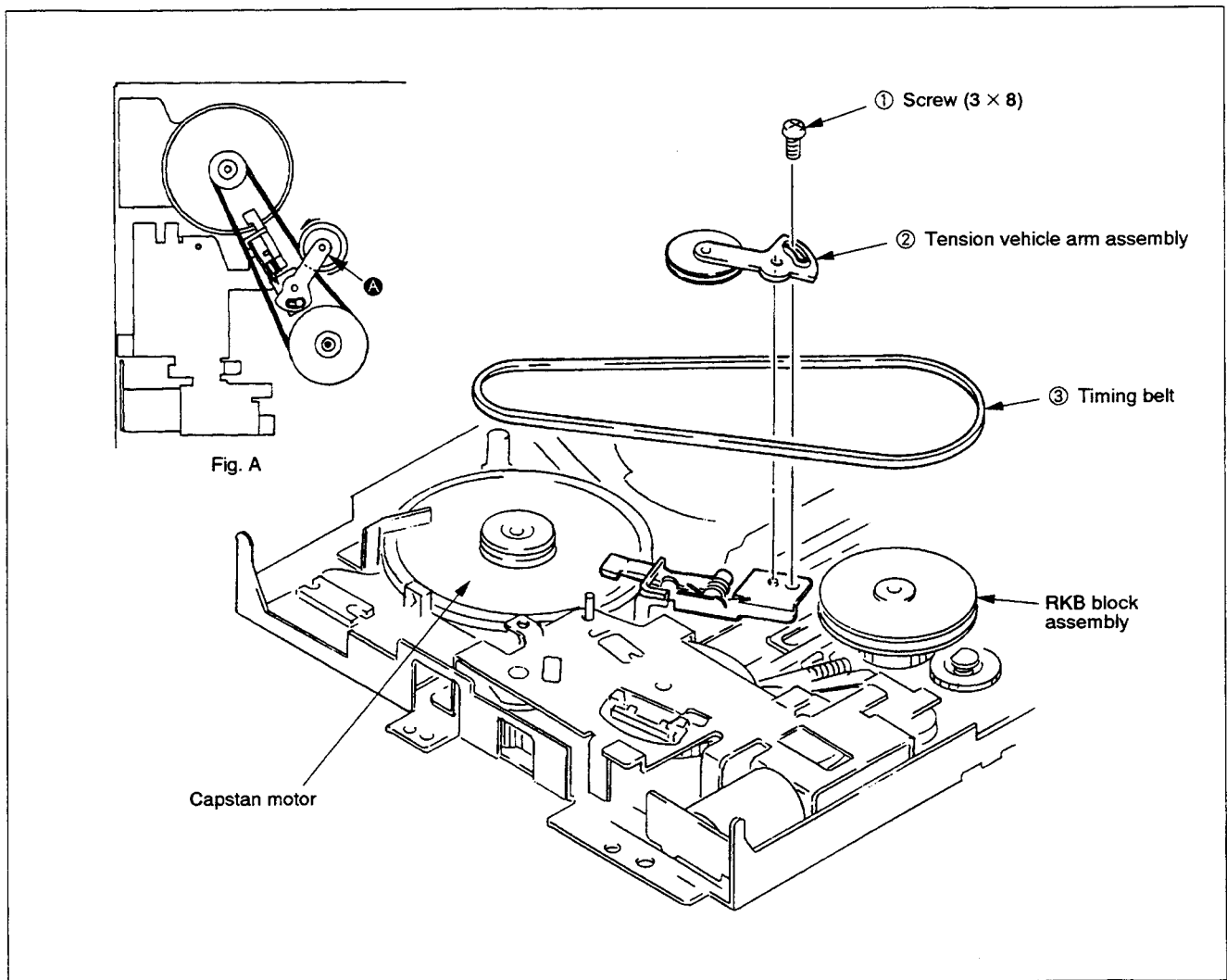


Fig. 3-3

### 3-4. CAP BRAKE ASSEMBLY (Fig. 3-4)

- 1) Remove tension vehicle arm assembly. (Refer to 3-3)
- 2) Remove torsion coil spring ① from portion ④ to remove CAP brake assembly.

#### [Note on Mounting]

- Mount torsion coil spring ① to CAP brake assembly ② in the order ④ and ⑤. (Fig. A)
- Put the fulcrum of CAP brake assembly ② to CAP brake shaft ③ and the tip of torsion coil spring to ⑥.
- Don't touch brake shoe ⑦ with bare hand.

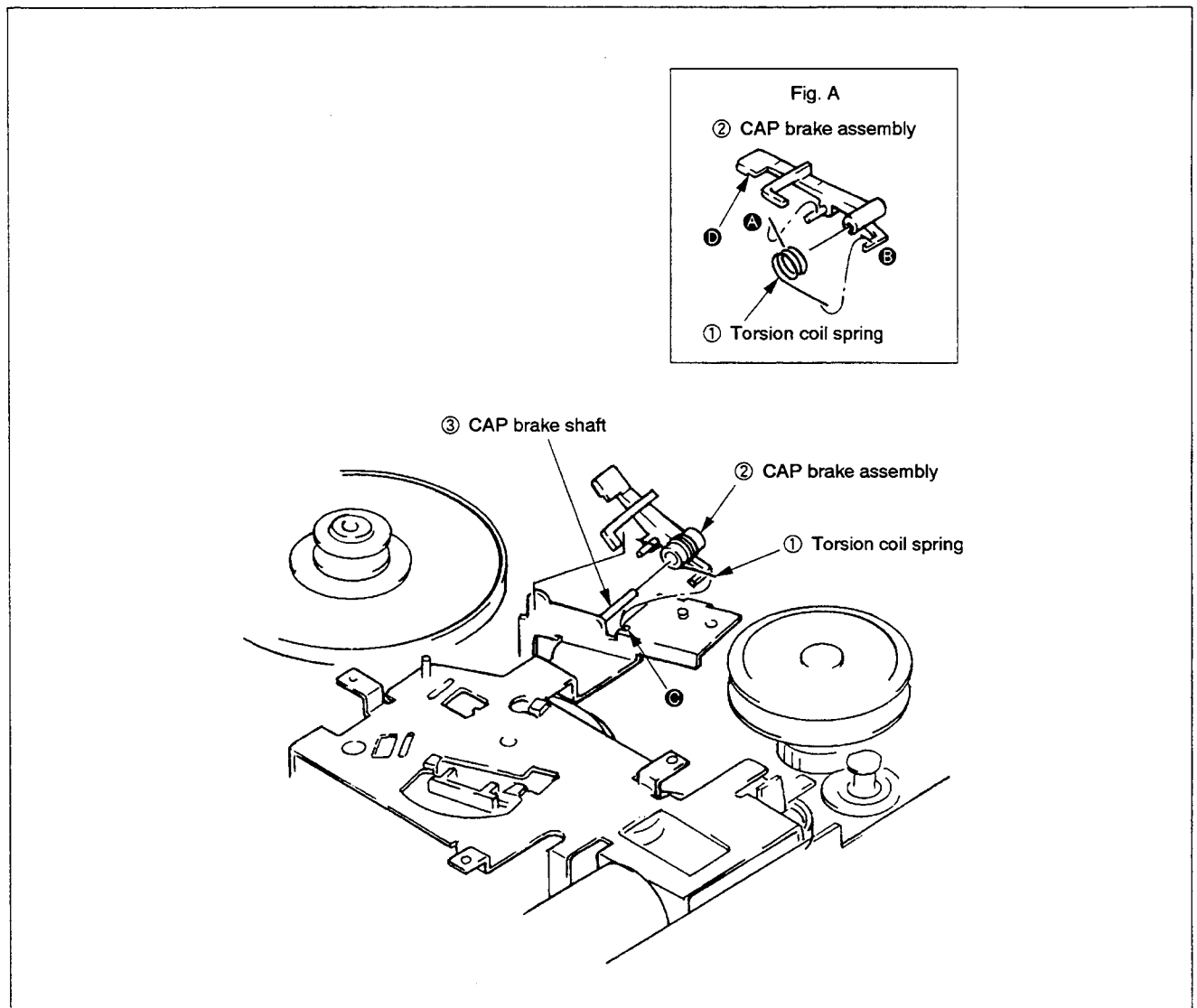


Fig. 3-4

### 3-5. TG2 ROLLER, FE HEAD ASSEMBLY (Fig. 3-5)

- 1) Remove claw **A** to pull out TG2 roller ①.
- 2) Remove screw ② to pull out FE head assembly.

#### [Note on Mounting]

- Keep clean the surface contacts tape of TG2 roller ①.

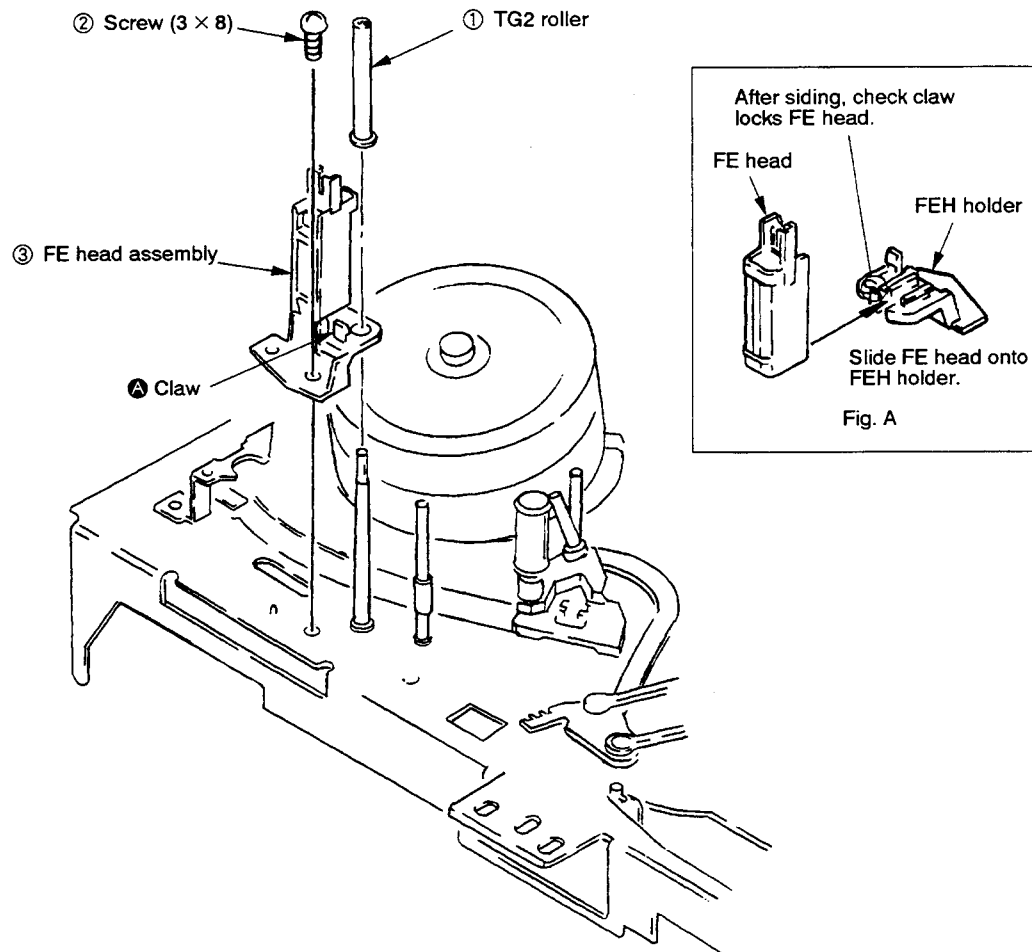


Fig. 3-5

### 3-6. PINCH PRESS BLOCK ASSEMBLY, ELEVATOR GEAR (Fig. 3-6)

- 1) Remove E ring ① to pull out pinch press block assembly ②.
- 2) Remove lid opener ③ by pressing claw A in the arrow B direction.
- 3) Pull out elevator gear ④.

#### [Note on Mounting]

- Apply grease FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions.
- Be sure to match the phase ⑥ between elevator gear ④ and press gear ⑤ on mounting elevator gear ④.

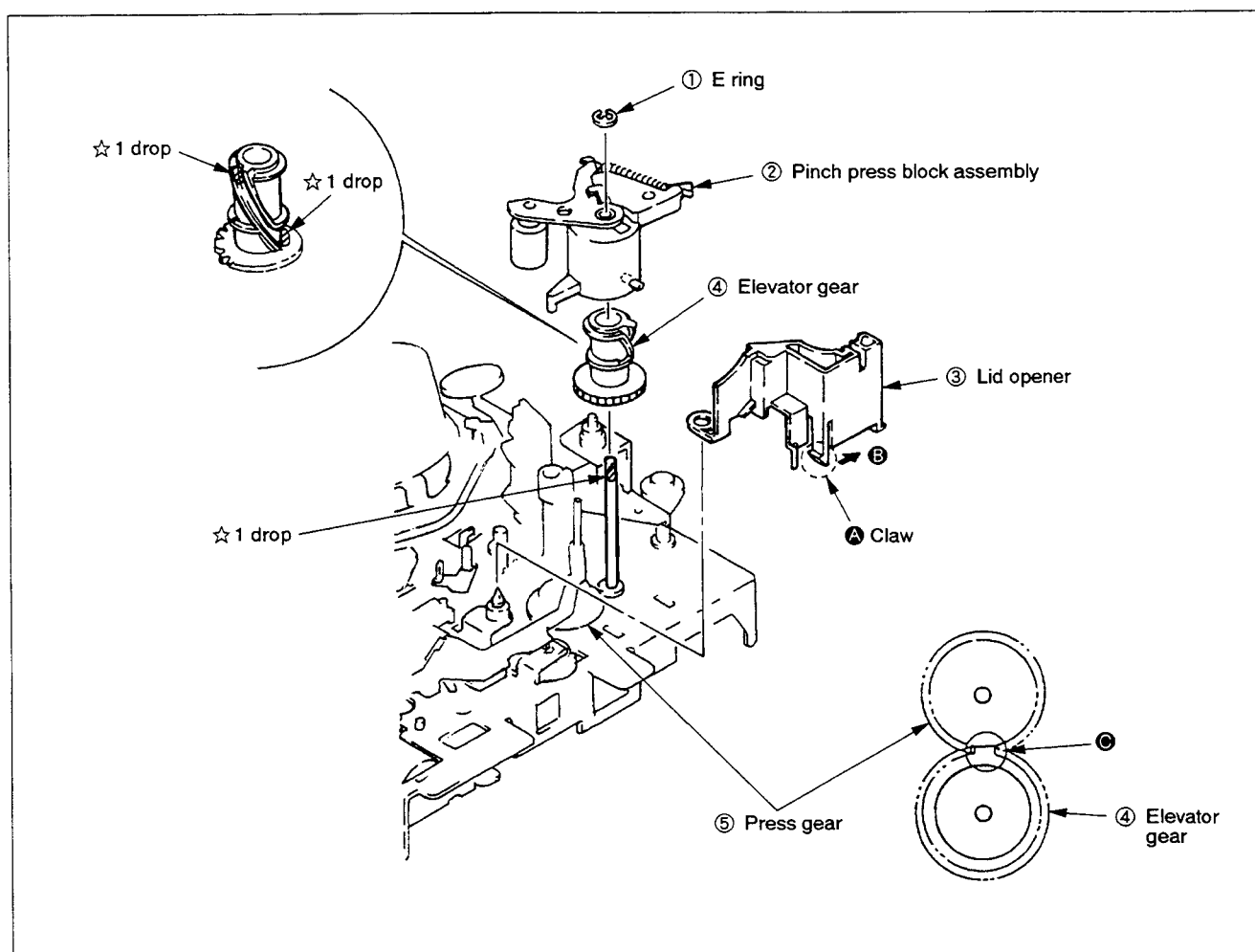


Fig. 3-6

### 3-7. ACE BLOCK ASSEMBLY (Fig. 3-7)

- 1) Move torsion coil spring (ACE) ① in the arrow A direction.
- 2) Remove ACE adjustment screw ②.
- 3) Remove AC height adjustment nut ③ to pull out ACE block assembly ④.

#### [Note on Mounting]

- Keep clean the surface contacts tape of ACE block assembly ④.
- Be sure to hang torsion coil spring (ACE) ① in the arrow B direction.
- Set ACE adjustment screw ② to the height as shown in Fig. A.

#### [Adjustment after Mounting]

- 4-1. Tape path adjustment.
- After adjustment apply Screw Lock G (1401B) (Jig Ref. No. J-14) at ☆ marked portion.

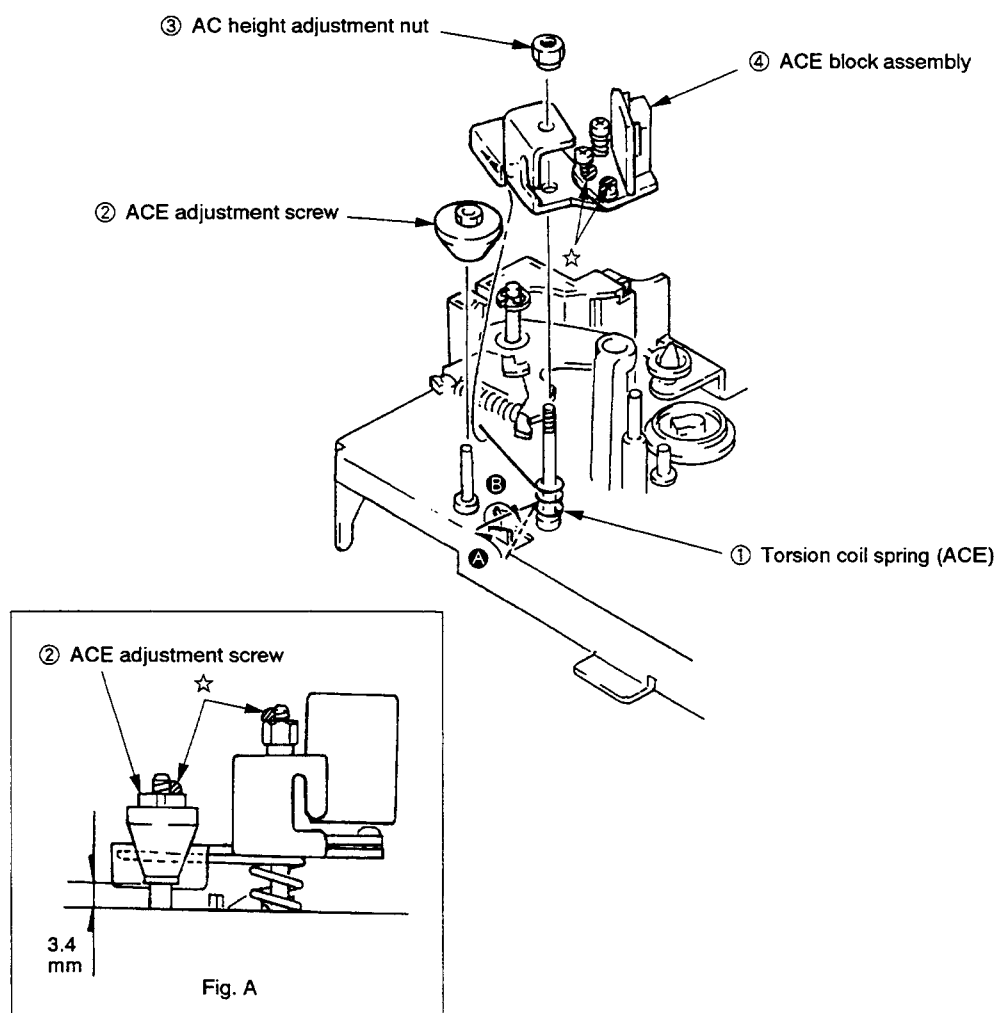


Fig. 3-7

### 3-8. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Fig. 3-8)

- 1) Loosen screw ① and pull out. TG3 guide roller assembly ② by turning it in the arrow A direction.
- 2) Loosen screw ③ and pull out TG6 guide roller assembly ④ by turning it in the arrow B direction.

#### [Note on Mounting]

- Keep clean the surface contacts tape of TG3 and TG6 guide roller assemblies ②, ④.

#### [Adjustment after Mounting]

- 4-1. Tape path adjustment.

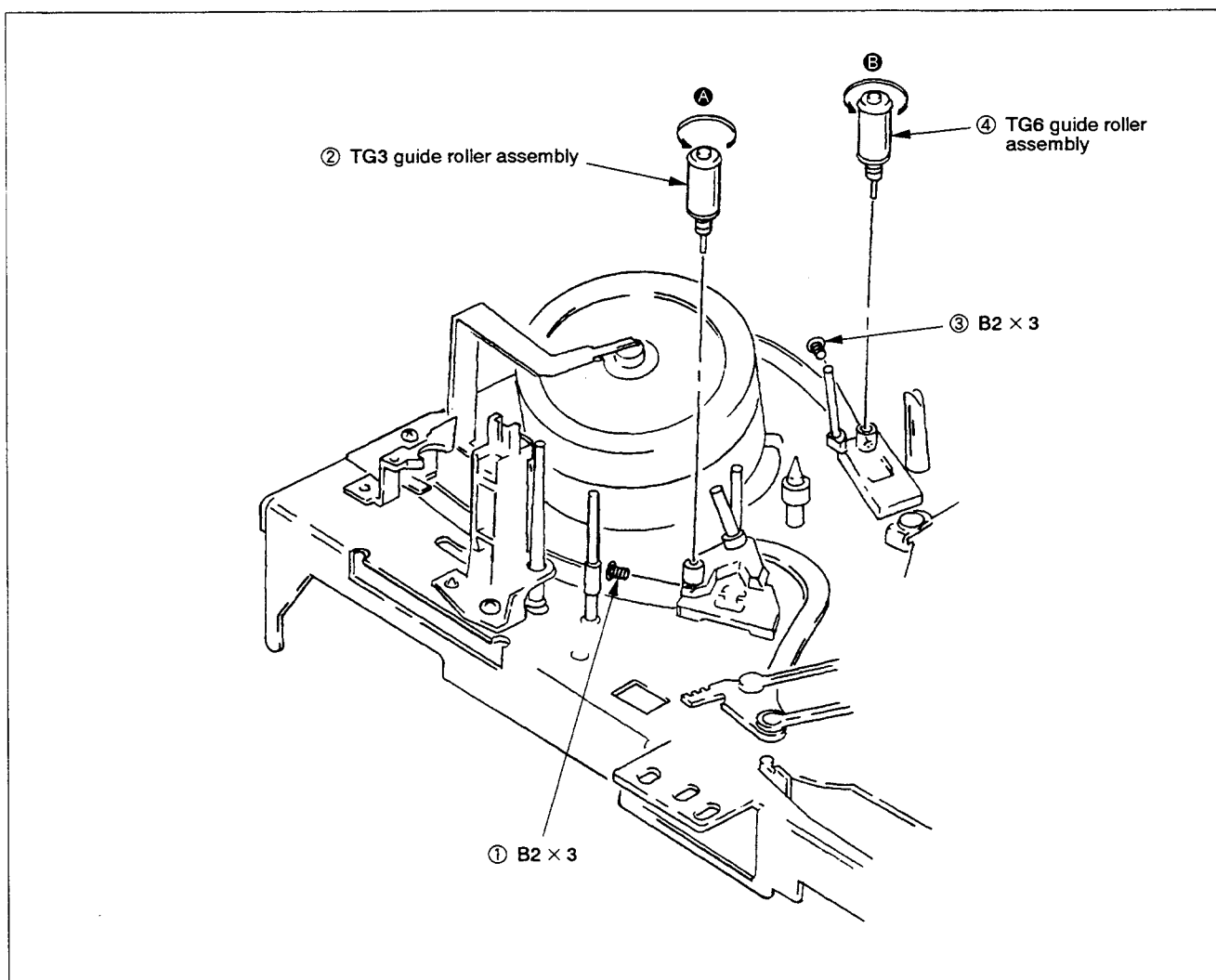


Fig. 3-8

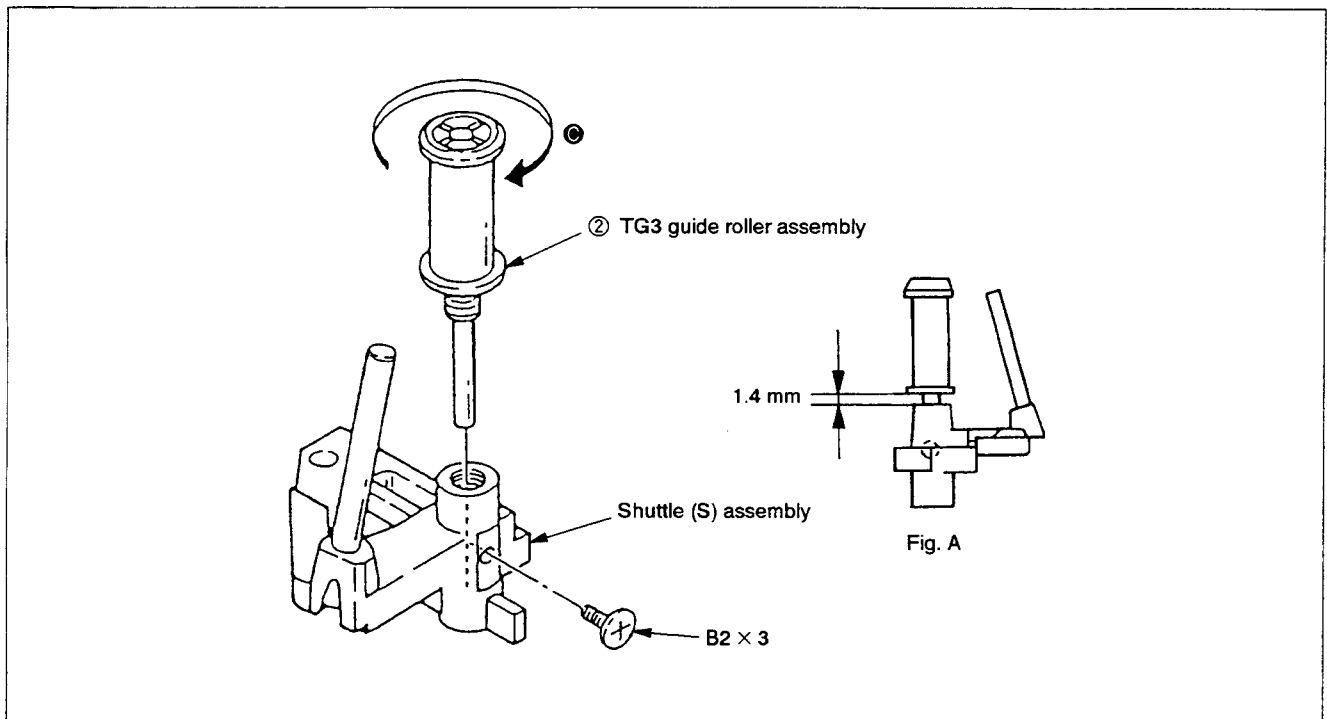


Fig. 3-9

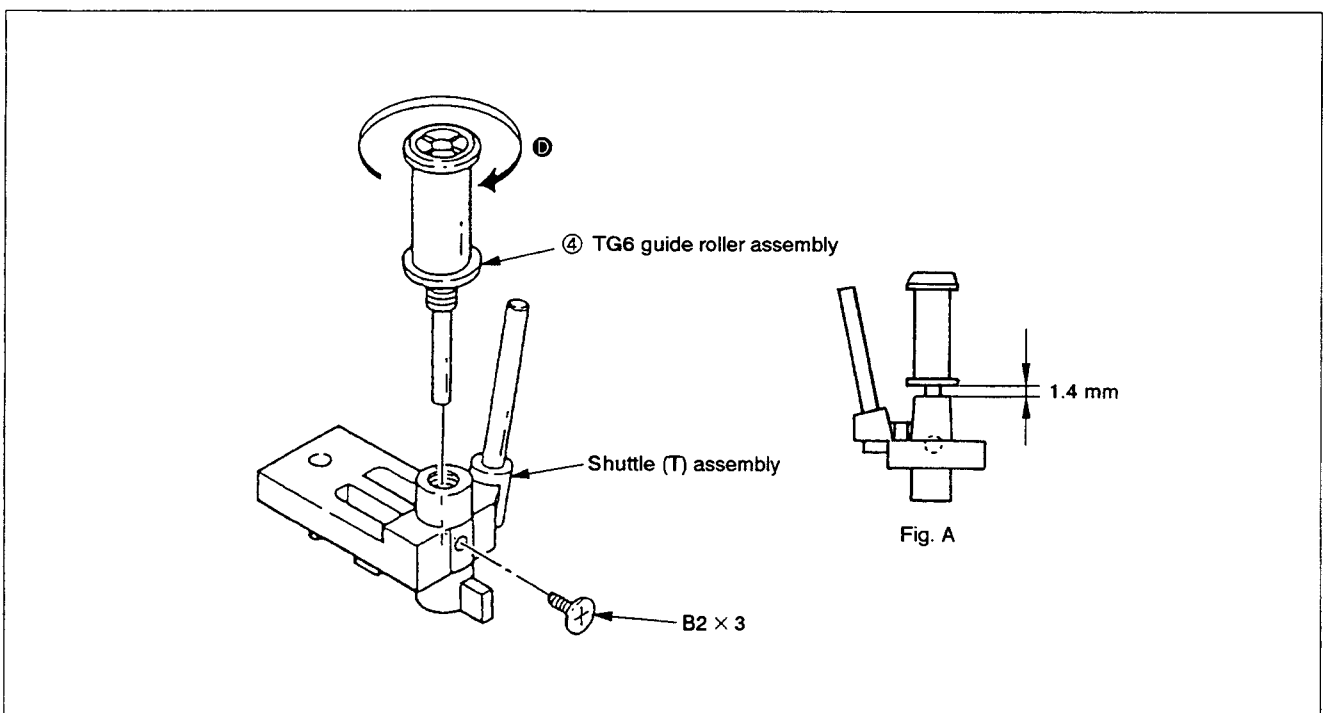


Fig. 3-10

### 3-9. CAPSTAN MOTOR (Fig. 3-11)

- 1) Remove timing belt. (Refer to 3-3.)
- 2) Remove CAP brake assembly. (Refer to 3-4.)
- 3) Remove screws ① to pull out capstan motor ②.

#### [Note on Mounting]

- Keep clean the surface contacts tape of capstan motor ②.
- On tightening screws ①, first tighten screw A temporarily, next tighten screws in the order B to C to A.

#### [Adjustment after Mounting]

- 4-1. Tape path adjustment.

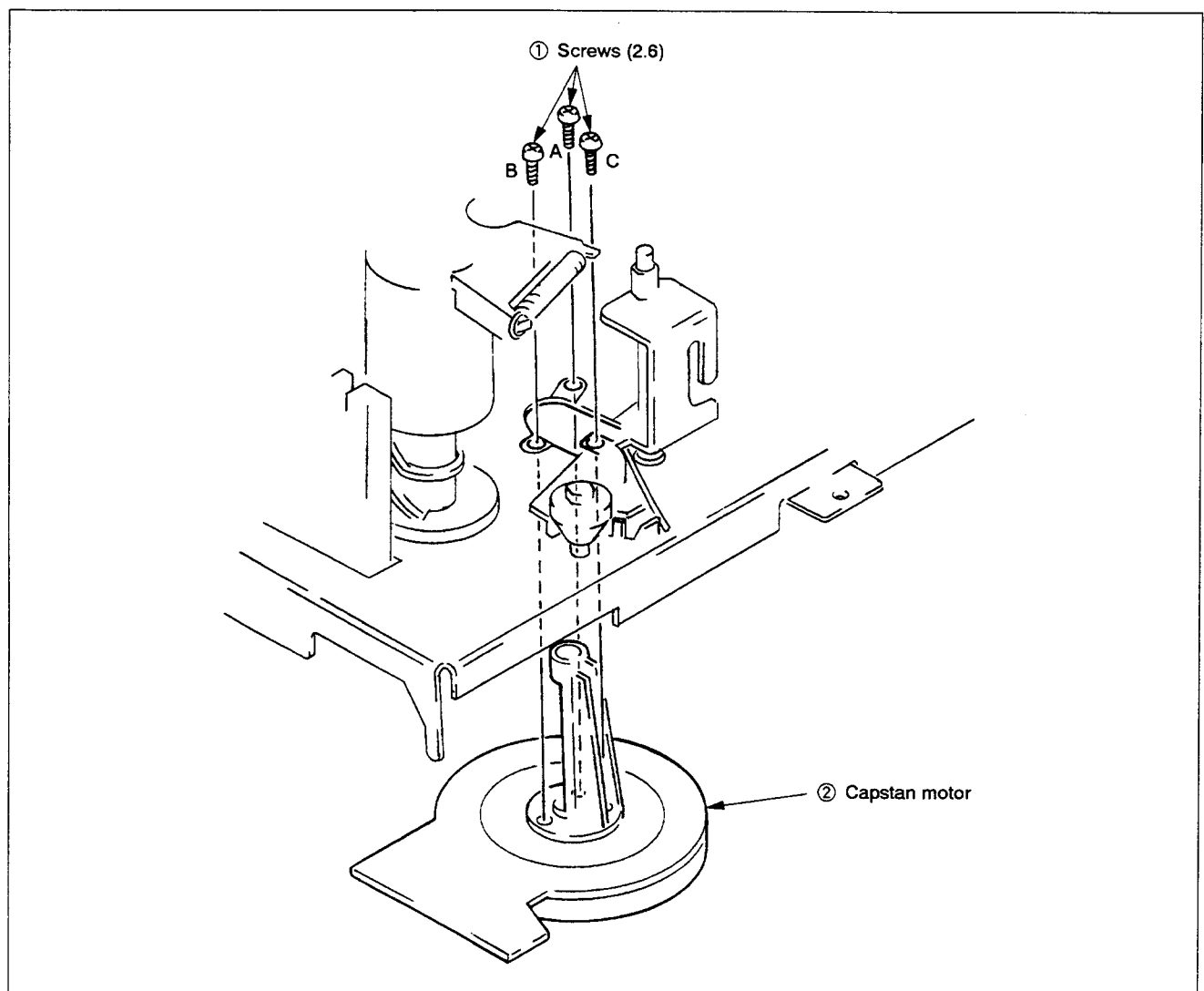


Fig. 3-11

### 3-10. MAIN BRAKE ASSEMBLIES S AND T (Fig. 3-12)

- 1) Remove tension spring ①.
- 2) Remove stopper washer (2) ② to remove neutrality arm ③.
- 3) Remove pendulum compulsion arm ④ and tension coil spring ⑤.
- 4) Remove stopper washer (2) ⑥ to remove main brake S assembly ⑦.
- 5) Remove stopper washer (2) ⑧ to remove main brake T assembly ⑨.

#### [Note on Mounting]

- Don't touch brake shoes A and B with bare hand.
- Apply FLOIL FG-055G (Jig Ref. No. J-12) to ☆ marked portions.

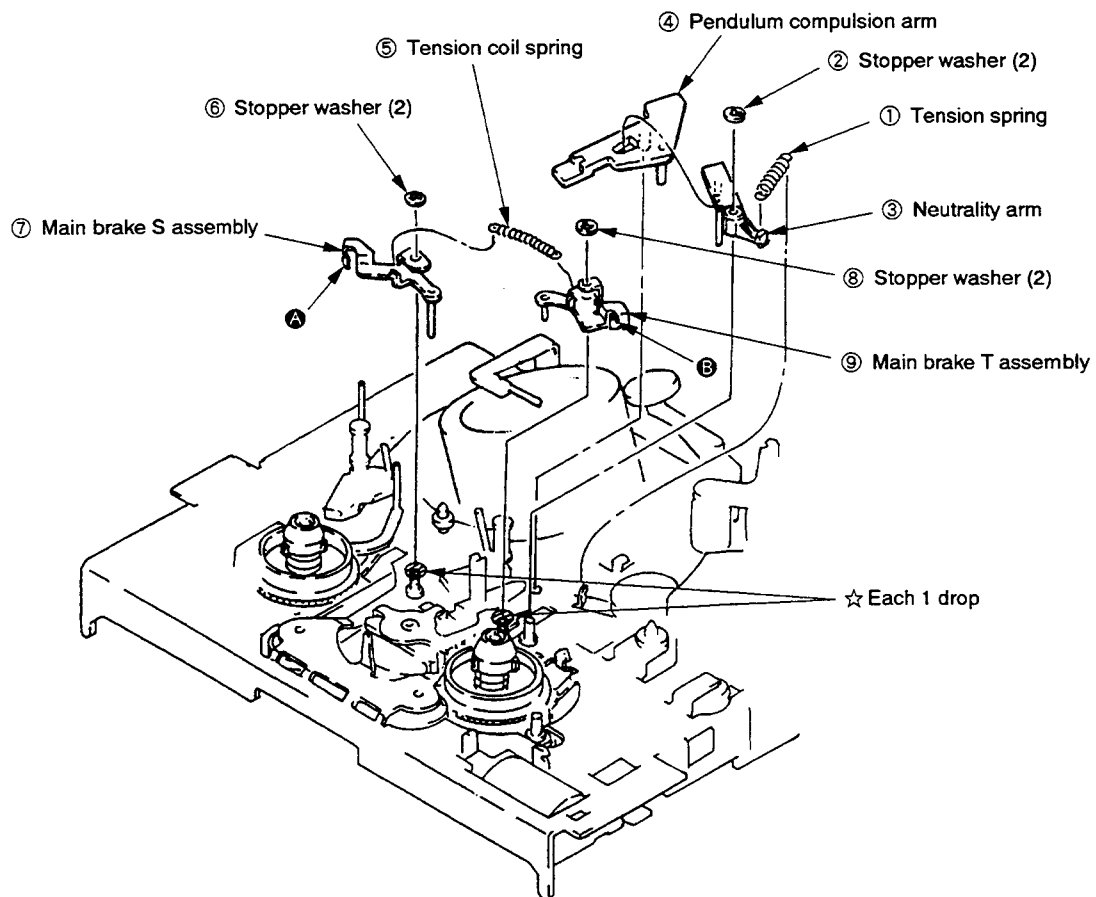


Fig. 3-12

### 3-11. SOFT BRAKE T ASSEMBLY (Fig. 3-13)

- 1) Remove pinch press block assembly. (Refer to 3-6.)
- 2) Remove lid opener ① carefully not to damage claw A.
- 3) Remove tension spring ② from side B to pull out soft brake T assembly ③.

#### [Note on Mounting]

- Don't touch brake shoes C with bare hand.

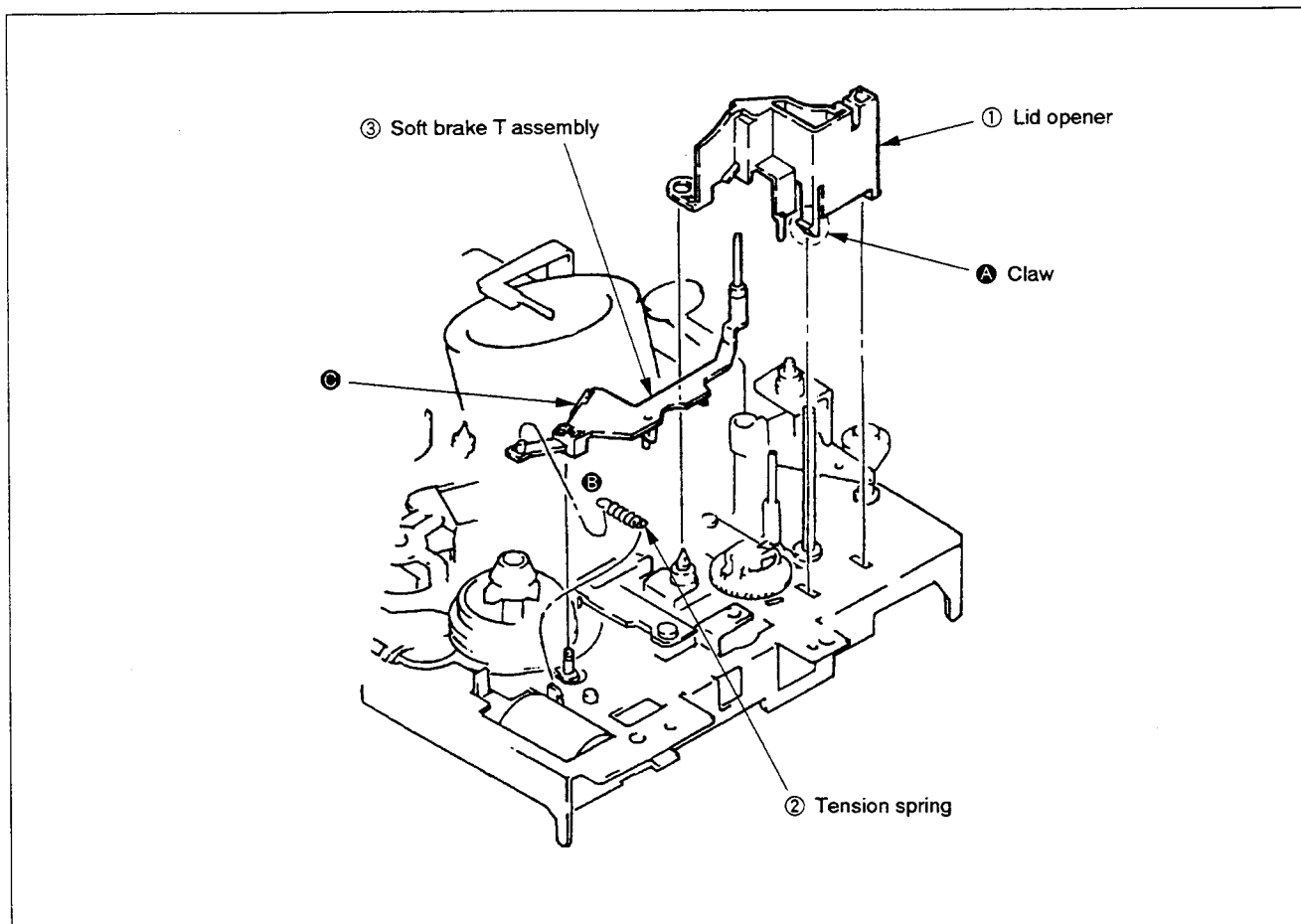


Fig. 3-13

### 3-12. RVS BRAKE ARM ASSEMBLY, REEL TABLE (T) ASSEMBLY (Fig. 3-14)

- 1) Remove main brake T assembly. (Refer to 3-10.)
- 2) Remove soft brake T assembly. (Refer to 3-11.)
- 3) Remove tension coil spring ① in the order A to B.
- 4) Remove RVS brake arm assembly ②.
- 5) Remove stopper washer (2) ③ to pull out reel table (T) assembly ④.

#### [Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion before mounting reel table (T) assembly ④. (Fig. A)
- Don't touch the hatched portion on reel table (T) assembly ④ and brake shoe ⑤ of RVS brake arm assembly ② with bare hand.

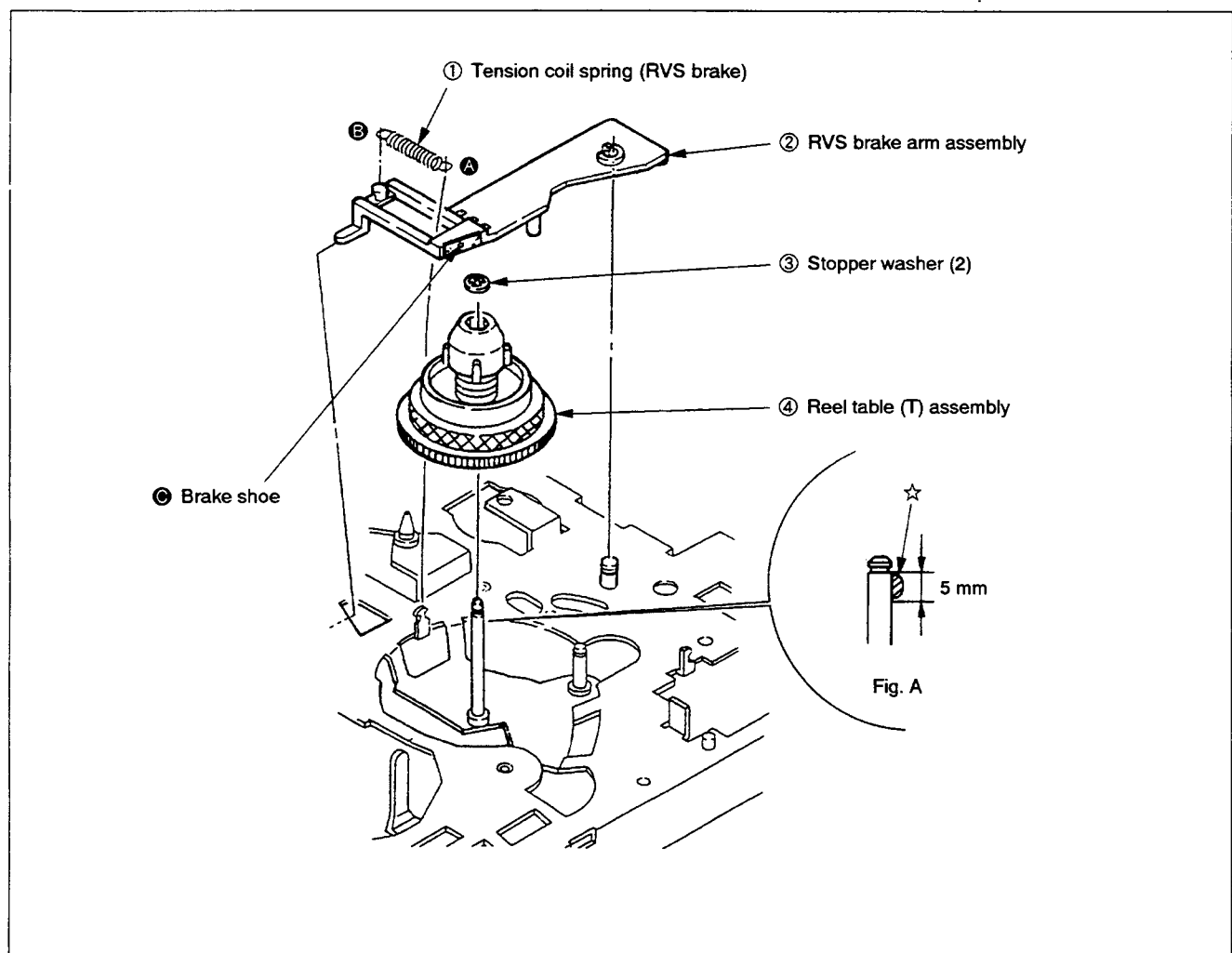


Fig. 3-14

### 3-13. TG8 ASSEMBLY (Fig. 3-15)

- 1) Remove TG8 retainer ① to pull out TG8 assembly ②.

#### [Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portion.
- Keep clean the surface contacts tape of TG8 assembly ②.
- Be careful not to change the shape of TG8 retainer ①.

#### [Adjustment after Mounting]

- 4-1. Tape path adjustment.

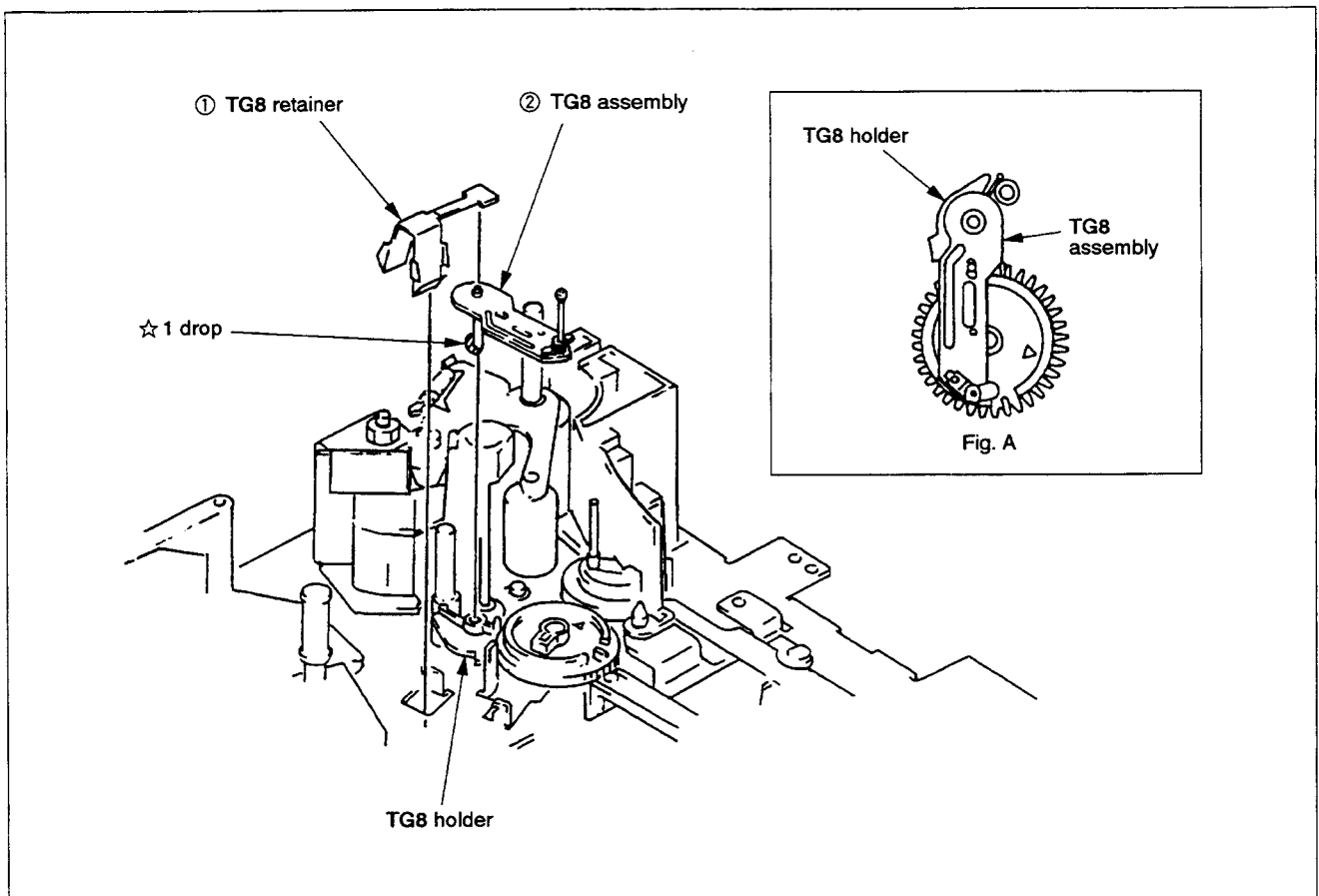


Fig. 3-15

### 3-14. TG8 HOLDER (Fig. 3-16)

- 1) Remove TG8 assembly. (Refer to 3-13)
- 2) Pull out TG8 holder ①.

#### [Note on Mounting]

- Be careful about the direction of TG8 holder ①. (A of Fig. A)

#### [Adjustment after Mounting]

- 4-1. Tape path adjustment.

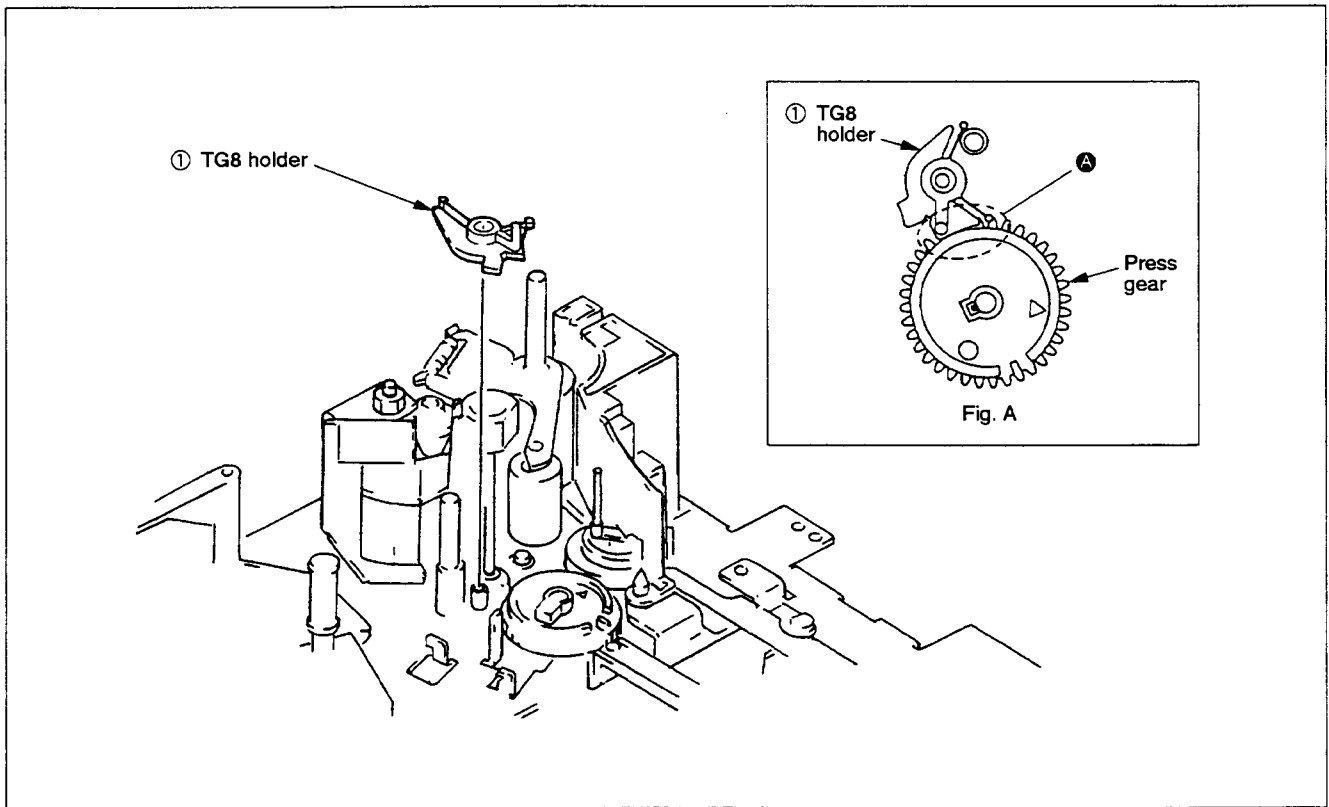


Fig. 3-16

### 3-15. TG8 AND PRESS GEARS (Fig. 3-17)

- 1) Remove pinch press block assembly. (Refer to 3-6.)
- 2) Remove soft brake T assembly. (Refer to 3-11.)
- 3) Remove TG8 assembly. (Refer to 3-13.)
- 4) Remove TG8 holder. (Refer to 3-14.)
- 5) Pull out TG8 gear ① or press gear ②.

#### [Note on Mounting]

- Adjust the holes on gears to the holes on chassis. (Fig. A)
- Adjust the arrows carved on gears each other. (Fig. A)

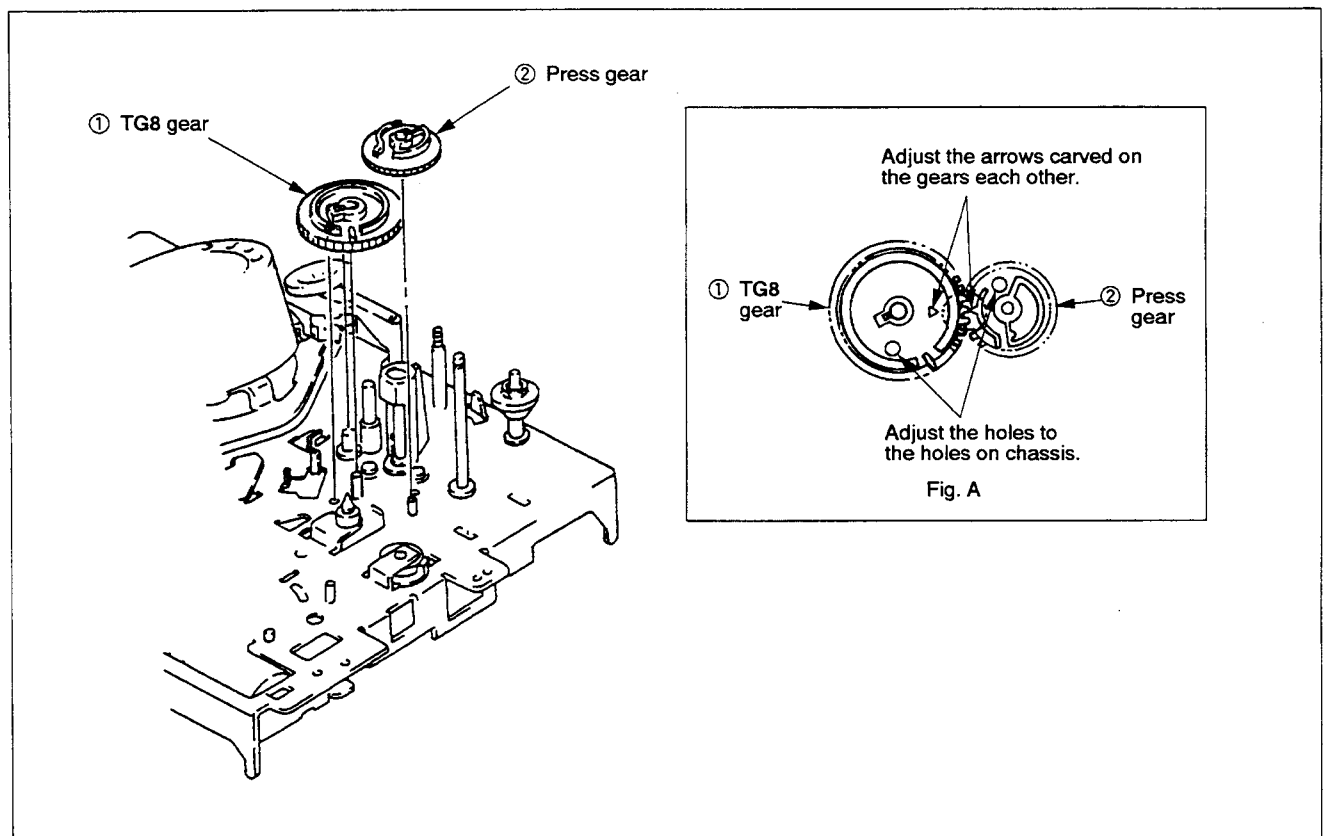


Fig. 3-17

### 3-16. CAM MOTOR CHASSIS BLOCK ASSEMBLY, UPPER/LOWER COMMUNICATION GEAR (Fig. 3-18)

- 1) Remove timing belt. (Refer to 3-3.)
- 2) Remove CAP brake assembly. (Refer to 3-4.)
- 3) Remove screws ① to remove cam motor chassis assembly ②.
- 4) Pull out upper/lower communication gear ③.

#### [Note on Mounting]

- First, check main slider ④ slides fully in the arrow **E** direction.
- Set rotary encoder switch position to "E" seen from the window of cam motor chassis. (Fig. A)
- Tighten screws ① in the order **A** to **B** to **C** to **D**.

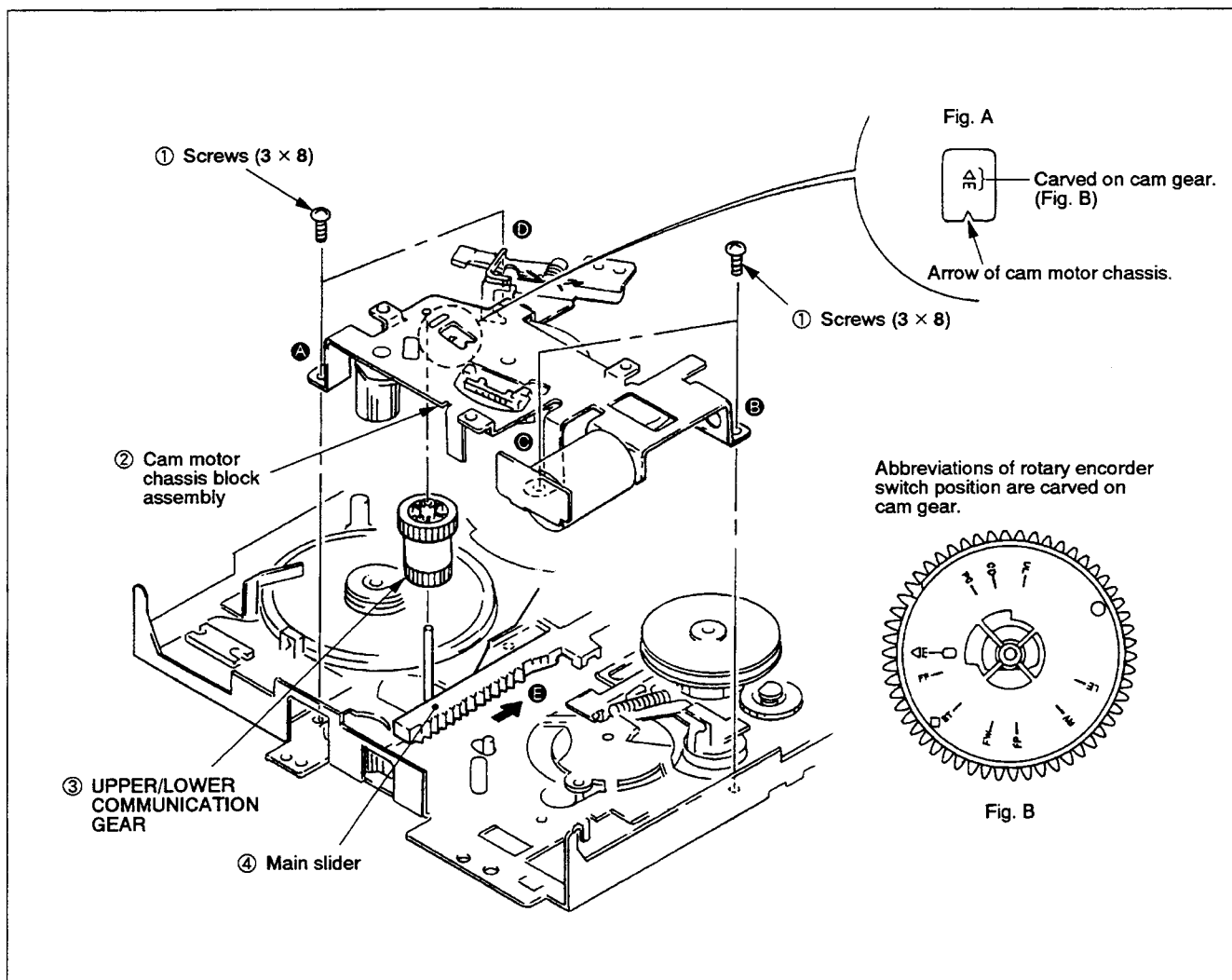


Fig. 3-18

### 3-17. ROTARY ENCODER SWITCH (Fig. 3-19)

- 1) Remove timing belt. (Refer to 3-3.)
- 2) Remove CAP brake assembly. (Refer to 3-4.)
- 3) Remove cam motor chassis block assembly (Refer to 3-15.) and turn upside on the bottom.
- 4) Remove stopper washer (2) ① to pull out worm wheel ②.
- 5) Remove stopper washer (2) ③ to pull out cam gear ④.
- 6) Pull out FL driving gear ⑤ and rotary encoder switch ⑥.

#### [Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions. (Fig. 3-19, A)
- Adjust the hole A to the hole on cam motor chassis. (Fig. B)
- Adjust the holes B and C to the hole on cam motor chassis. (Fig. C)

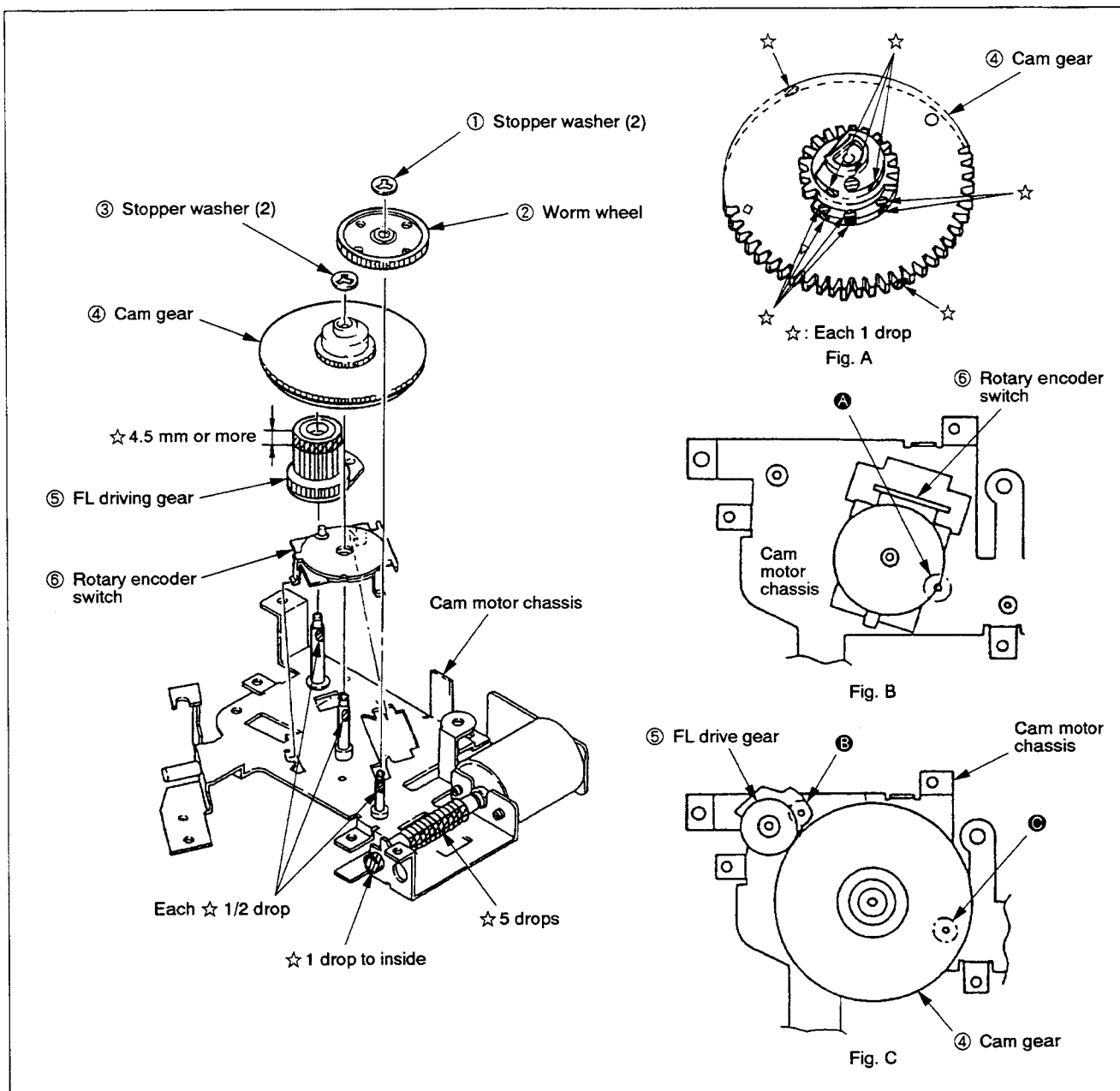


Fig. 3-19

### 3-18. MAIN SLIDER (Fig. 3-20)

- 1) Remove timing belt. (Refer to 3-3.)
- 2) Remove CAP brake assembly. (Refer to 3-4.)
- 3) Remove cam motor chassis block assembly. (Refer to 3-16.)
- 4) Remove screw ① to remove retainer ②.
- 5) Pull out main slider ③.

#### [Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) as shown in Fig. A.
- At the last, slide main slider fully in the arrow **A** direction.

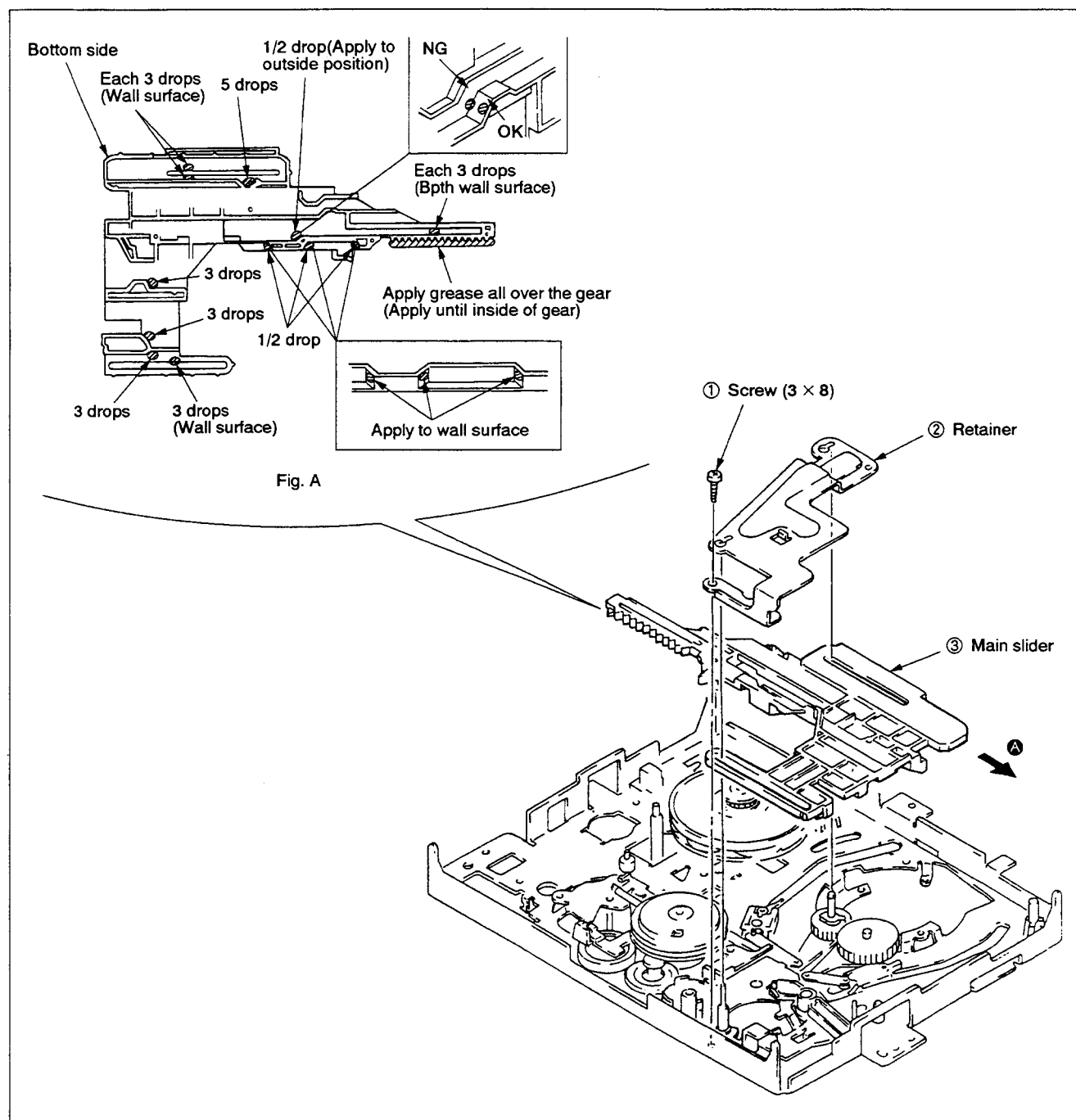


Fig. 3-20

### 3-19. SHUTTLE T BLOCK AND LOADING GEAR T BLOCK ASSEMBLIES (Fig. 3-21)

- 1) Remove timing belt. (Refer to 3-3.)
- 2) Remove CAP brake assembly. (Refer to 3-4.)
- 3) Remove cam motor chassis block assembly. (Refer to 3-16.)
- 4) Remove main slider. (Refer to 3-18.)
- 5) Remove screw ① to remove loading leaf (T) spring ② and shuttle T block assembly ③.
- 6) Pull out loading gear T block assembly ④.

#### [Note on Mounting]

- Adjust the phase **A** between loading gear (T) and loading gear (S). (Fig. A)
- Keep clean the surface contacts tape of shuttle T block assembly ③.

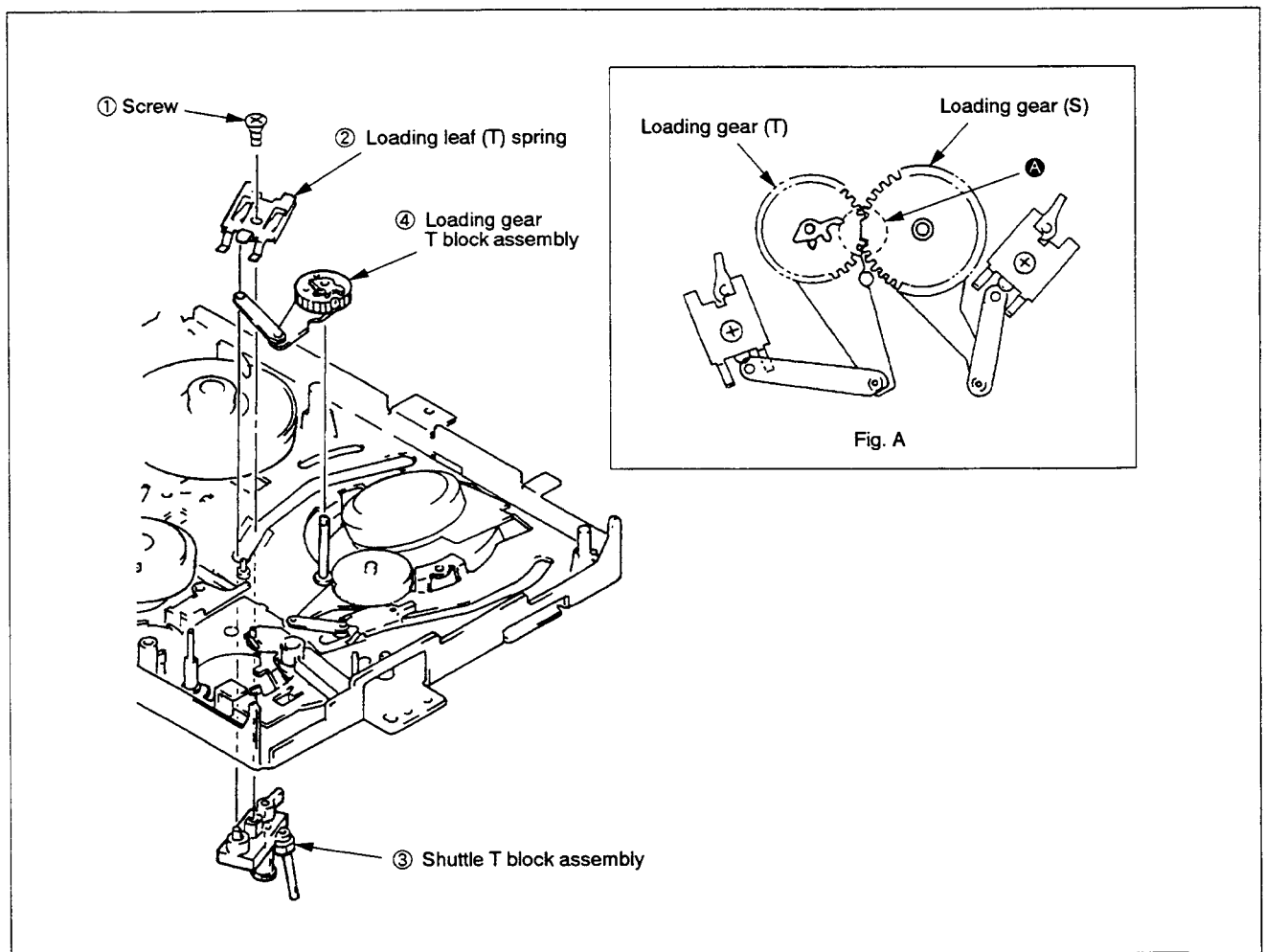


Fig. 3-21

### 3-20. SHUTTLE S BLOCK AND LOADING GEAR S BLOCK ASSEMBLIES (Fig. 3-22)

- 1) Remove timing belt. (Refer to 3-3.)
- 2) Remove CAP brake assembly. (Refer to 3-4.)
- 3) Remove cam motor chassis block assembly. (Refer to 3-16.)
- 4) Remove main slider. (Refer to 3-15.)
- 5) Remove screw ① to remove loading leaf (S) spring ② and shuttle S block assembly ③.
- 6) Pull out loading gear S block assembly ④.

#### [Note on Mounting]

- Adjust the phase **A** between loading gear (S) and loading gear (T). (Fig. A)
- Keep clean the surface contacts tape of shuttle S block assembly ③.

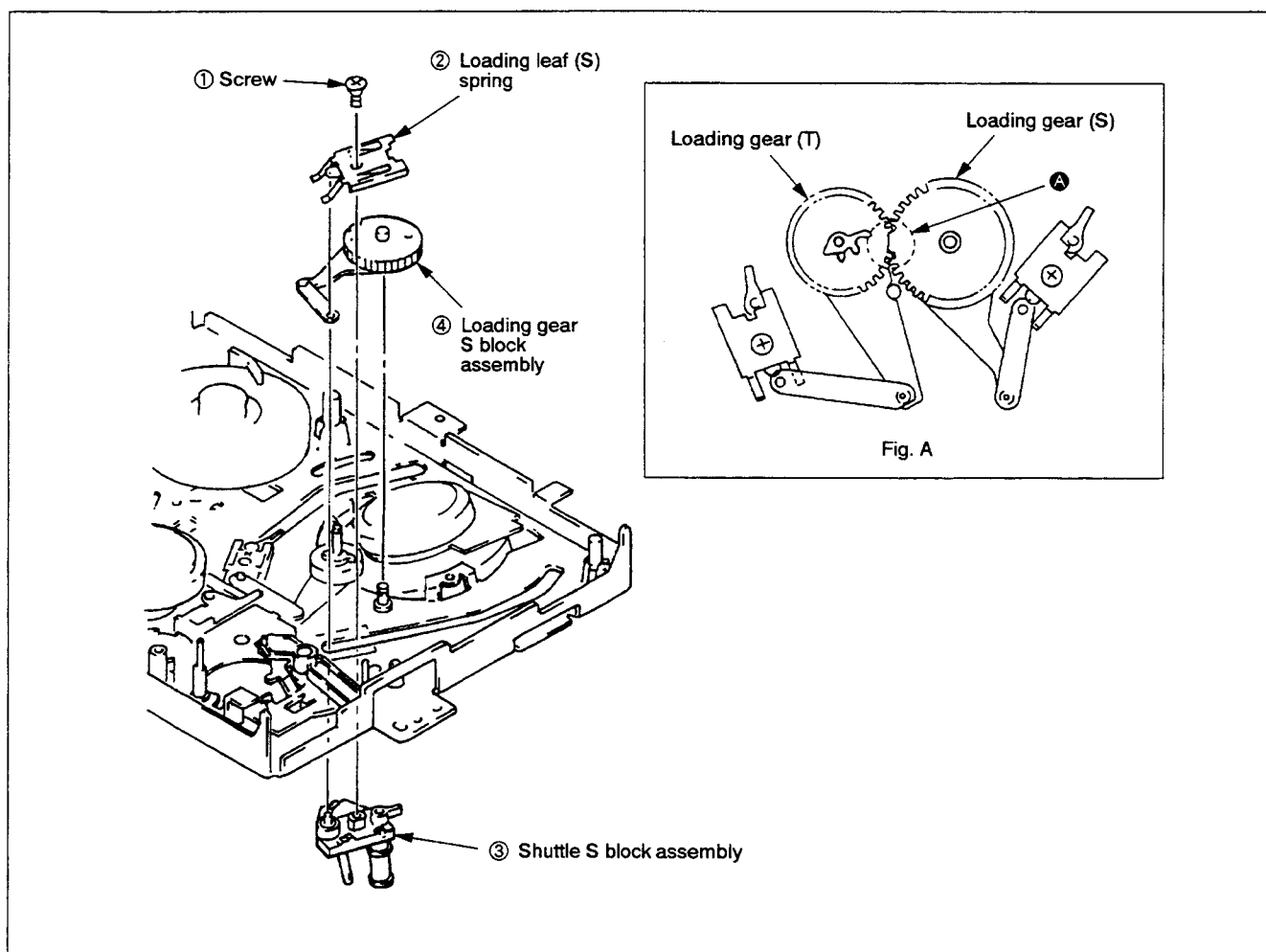


Fig. 3-22

### 3-21. REEL TABLE (S) ASSEMBLY (Fig. 3-23)

- 1) Remove tension spring ① from the chassis side.
- 2) Remove stopper washer (2) ② to pull out soft brake (S) ③.
- 3) Move TG1 band ④ over the reel table.
- 4) Remove stopper washer (2) ⑤.
- 5) While pressing main brake S assembly ⑥, pull out reel table (S) assembly ⑦.

#### [Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion before mounting reel table (S) assembly ⑥.  
(Fig. A)
- Don't touch the hatched portion on reel table (S) assembly ⑥ with bare hand.

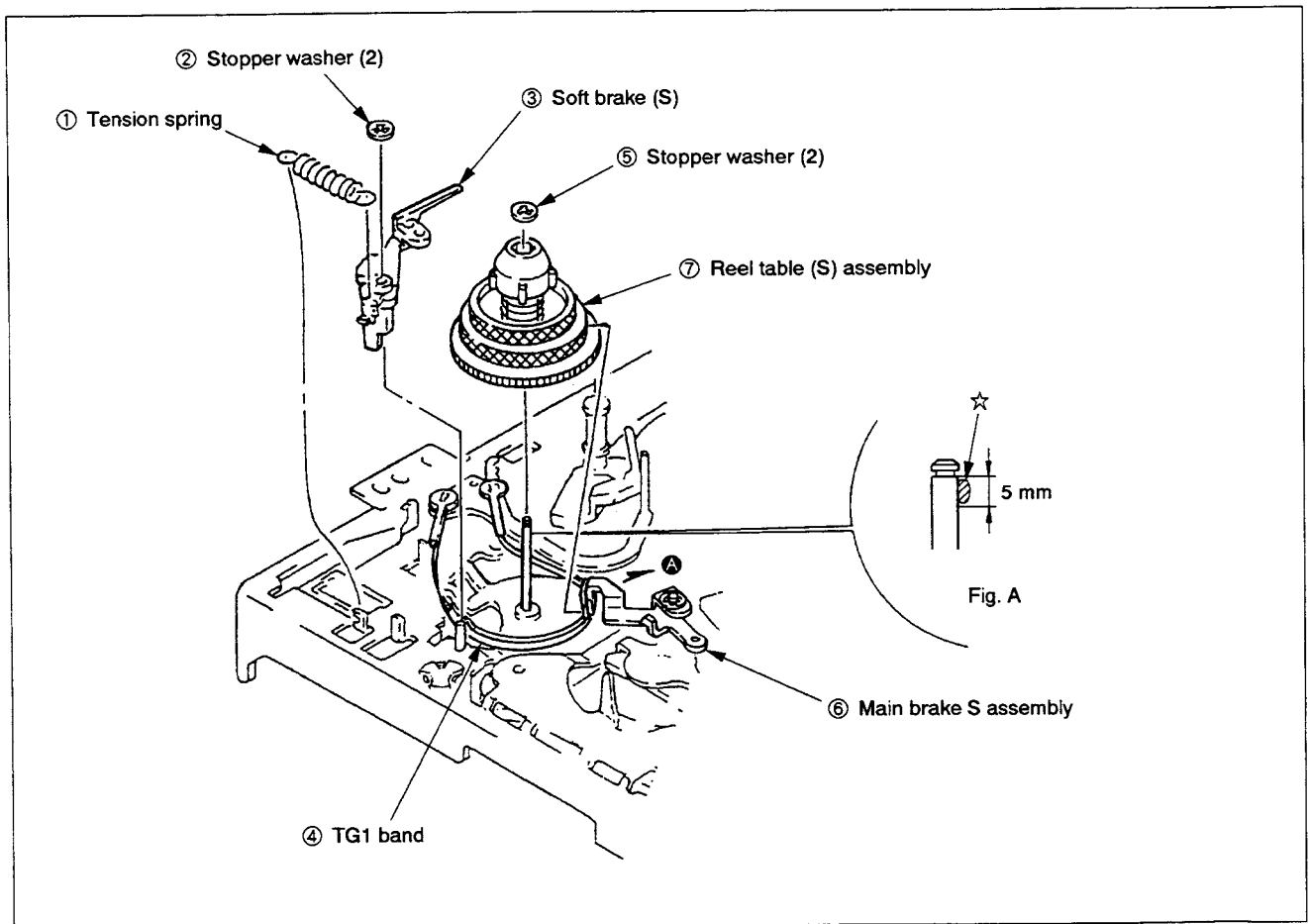


Fig. 3-23

### 3-22. TG1 ASSEMBLY (Fig. 3-24)

- 1) Set the mechanism to the loading-end condition referring to 1-1. (Cam gear indicates "LE". (Refer to Fig. A and B of Fig. 3-18.))
- 2) Remove tension spring ① in the order A to B.
- 3) Remove stopper washer (2) ② to pull out TG1 assembly ③.

#### [Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion.
- Keep clean the felt side of TG1 assembly.

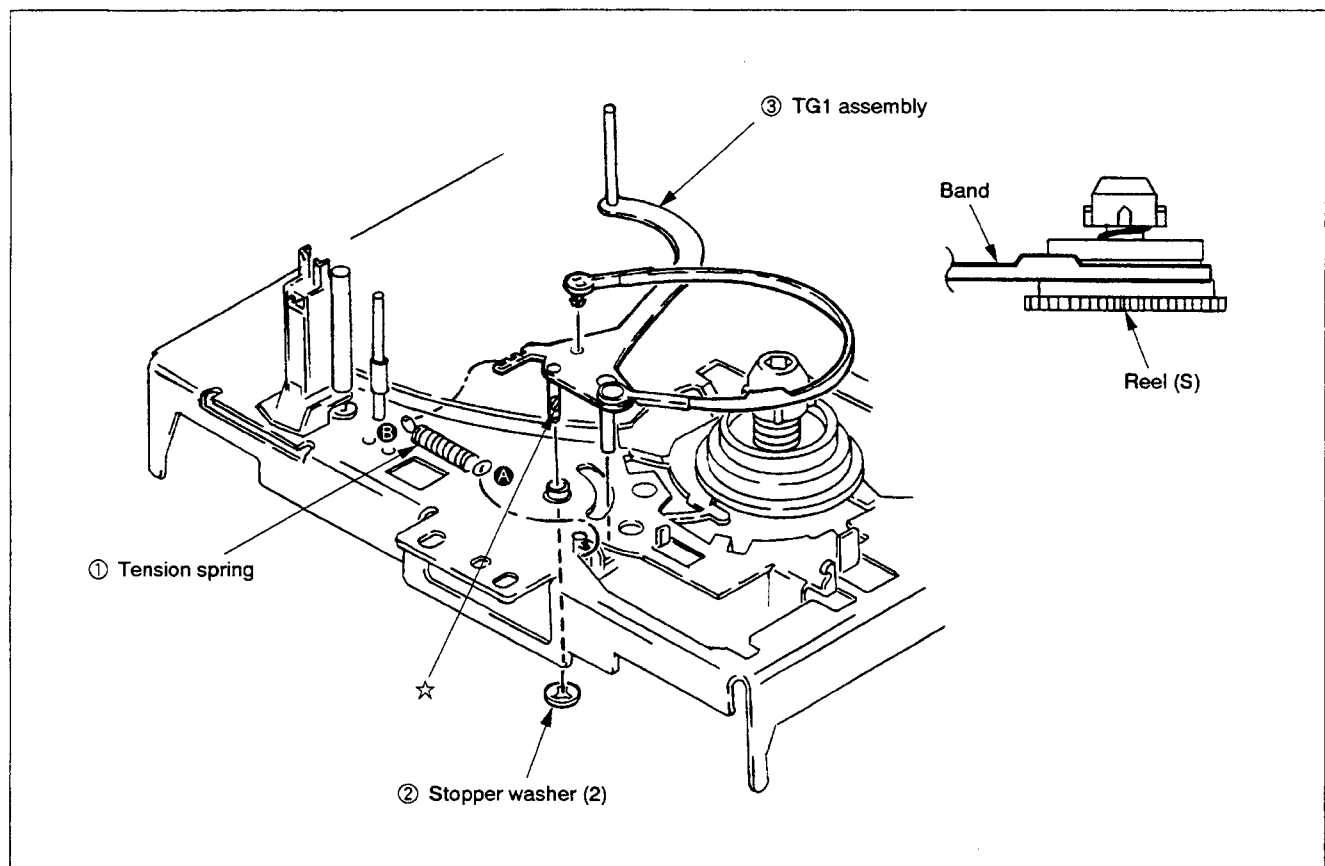


Fig. 3-24

### 3-23. S WINDING BLOCK ASSEMBLY (Fig. 3-25)

- 1) Remove timing belt. (Refer to 3-3.)
- 2) Remove CAP brake assembly. (Refer to 3-4.)
- 3) Remove cam motor chassis block assembly. (Refer to 3-16.)
- 4) Remove main slider. (Refer to 3-18.)
- 5) Remove stopper washer (2) ① to pull out S winding block assembly ②.
- 6) Remove torsion spring ③.

#### [Note on Mounting]

- At the last, hang torsion spring ② to the position A.
- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions.

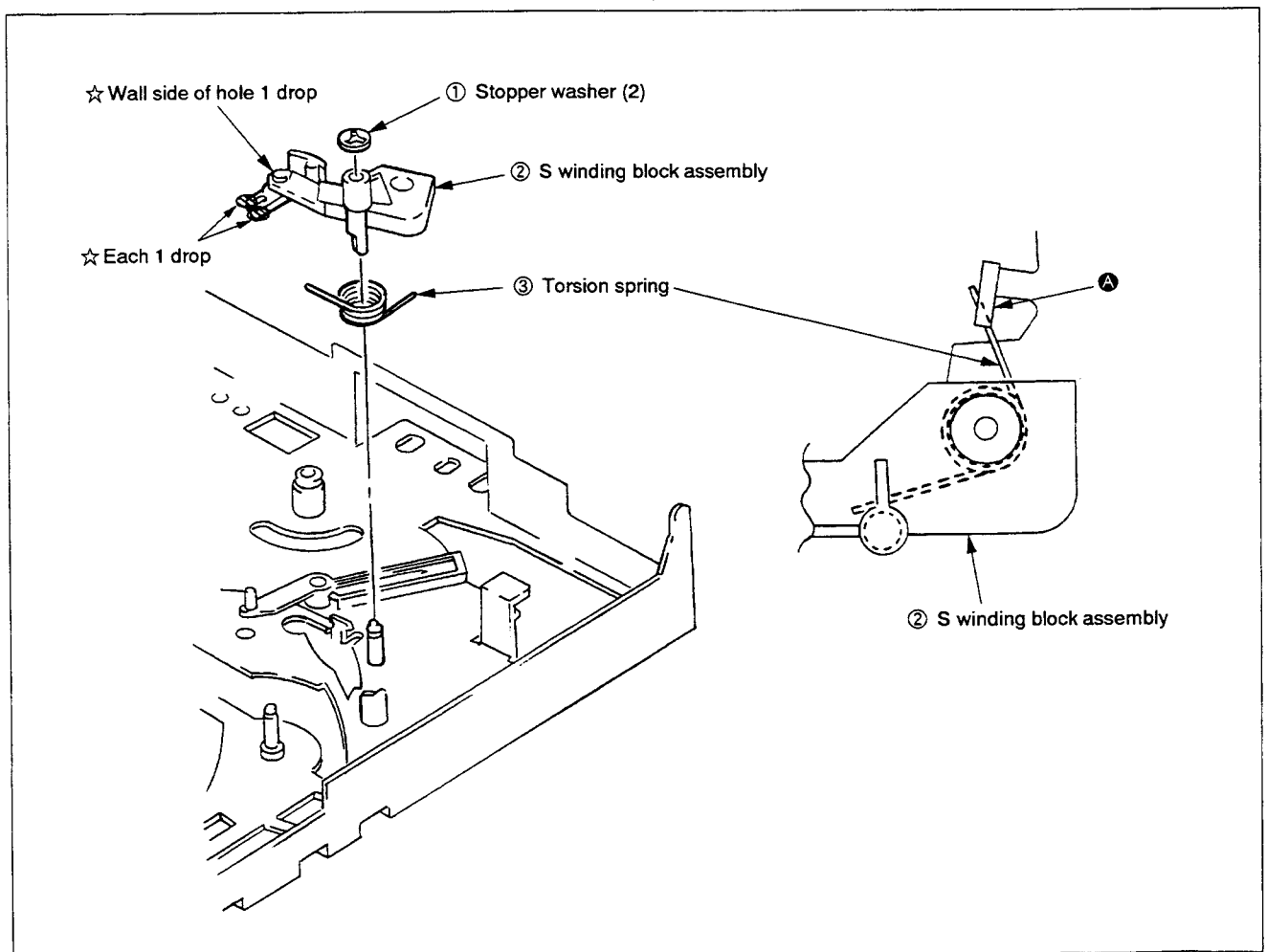


Fig. 3-25

### 3-24. TRIGGER LEVER AND RKB BLOCK ASSEMBLIES (Fig. 3-26)

- 1) Remove timing belt. (Refer to 3-3.)
- 2) Remove CAP brake assembly. (Refer to 3-4.)
- 3) Remove cam motor chassis block assembly. (Refer to 3-16.)
- 4) Remove main slider. (Refer to 3-18.)
- 5) Remove tension spring ① in the order **A** to **B** to remove trigger lever assembly ②.
- 6) Remove screws (3 × 8) ③ to remove RKB block assembly ④.

#### [Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions on trigger lever assembly. (Fig. A)

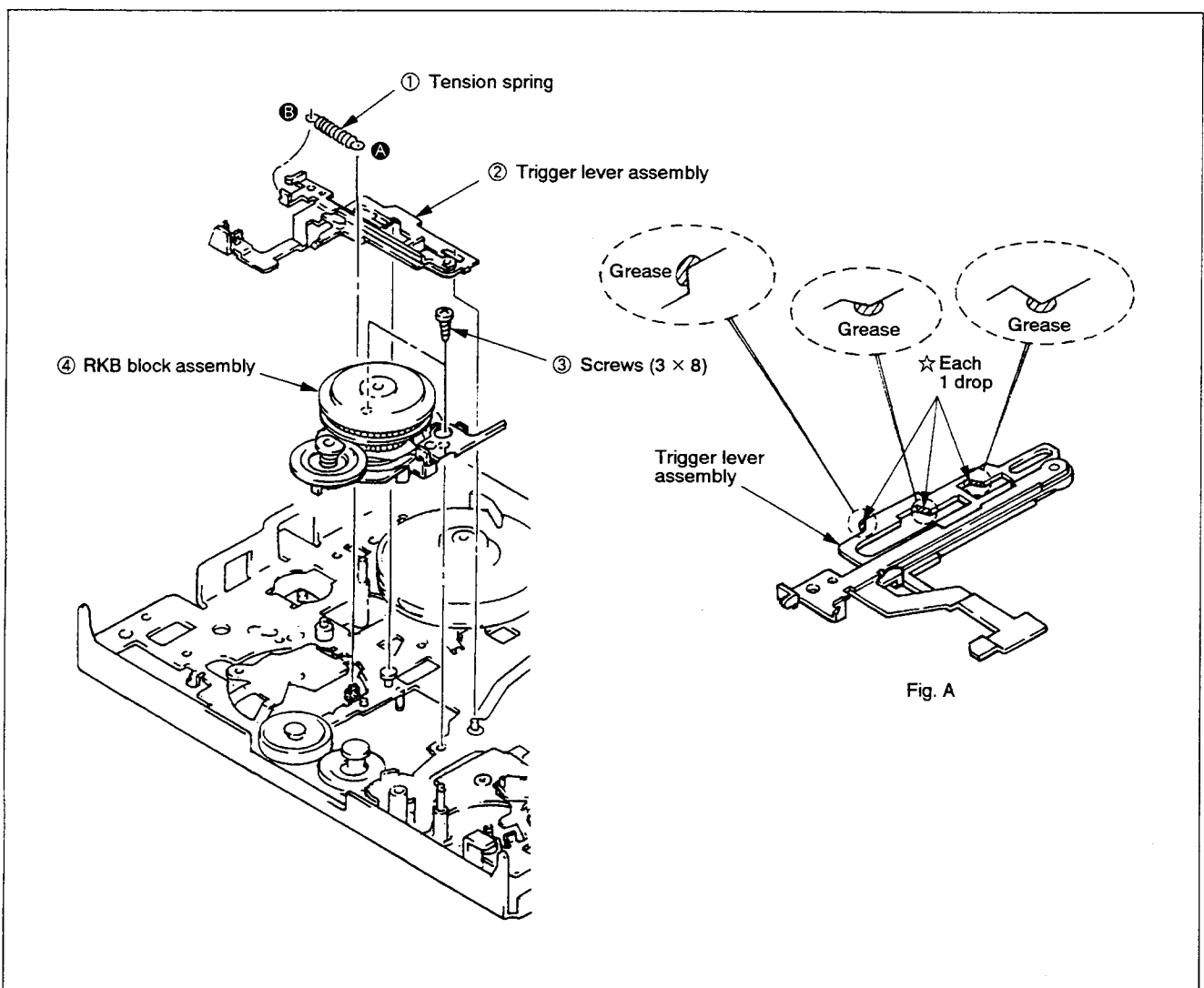


Fig. 3-26

## 4. ADJUSTMENT

### 4-1. TAPE PATH ADJUSTMENT

The "Tape path" refers to the route of the tape from the supply reel disk to the take-up reel disc via the video heads.

Each component part of the tape transport system particularly the surface of parts which make direct contact with the tape must always be kept clean, free of dust, oil, scratches and so forth.

The tape path system is factory preadjusted, when parts of the tape transport system are replaced, be sure to make the required adjustments as precisely as possible in order to ensure stable tape transport.

#### 4-1-1. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Fig. 4-1)

**Purpose:** stabilizes contact of the video head and the tape to maintain the tension of the tape so that it feeds at a constant level.

##### • Position adjustment

|                      |                                                 |
|----------------------|-------------------------------------------------|
| Mode                 | Treading is completed without a cassette loaded |
| Adjustment locations | Eccentric pin of TG1 band assembly              |

##### [Adjustment Method]

- 1) Allow the unit to go through the threading procedure without a cassette loaded.

- 2) Set the unit to play back, then turn the eccentric pin so that the tip of tension arm goes to the left side line carved on the mechanical chassis. (Fig. A)
- 3) After adjustment, go through the loading procedure once more without a cassette loaded, then check the position of the tension arm.

##### • Tension adjustment

|                           |                                         |
|---------------------------|-----------------------------------------|
| Mode                      | Playback                                |
| Measuring instrument/tool | Torque cassette                         |
| Adjustment locations      | Position for hooking the tension spring |
| Specified value           | 36 to 44 g•cm                           |

##### [Adjustment Method]

- 1) Playback the torque cassette.
- 2) Check that the center value deviation reading on the torque cassette meets with the standards.
- 3) When the reading is higher than the standards: Move the spring toward direction **A**.  
When the reading is less than the standards: Move the spring toward direction **B**.

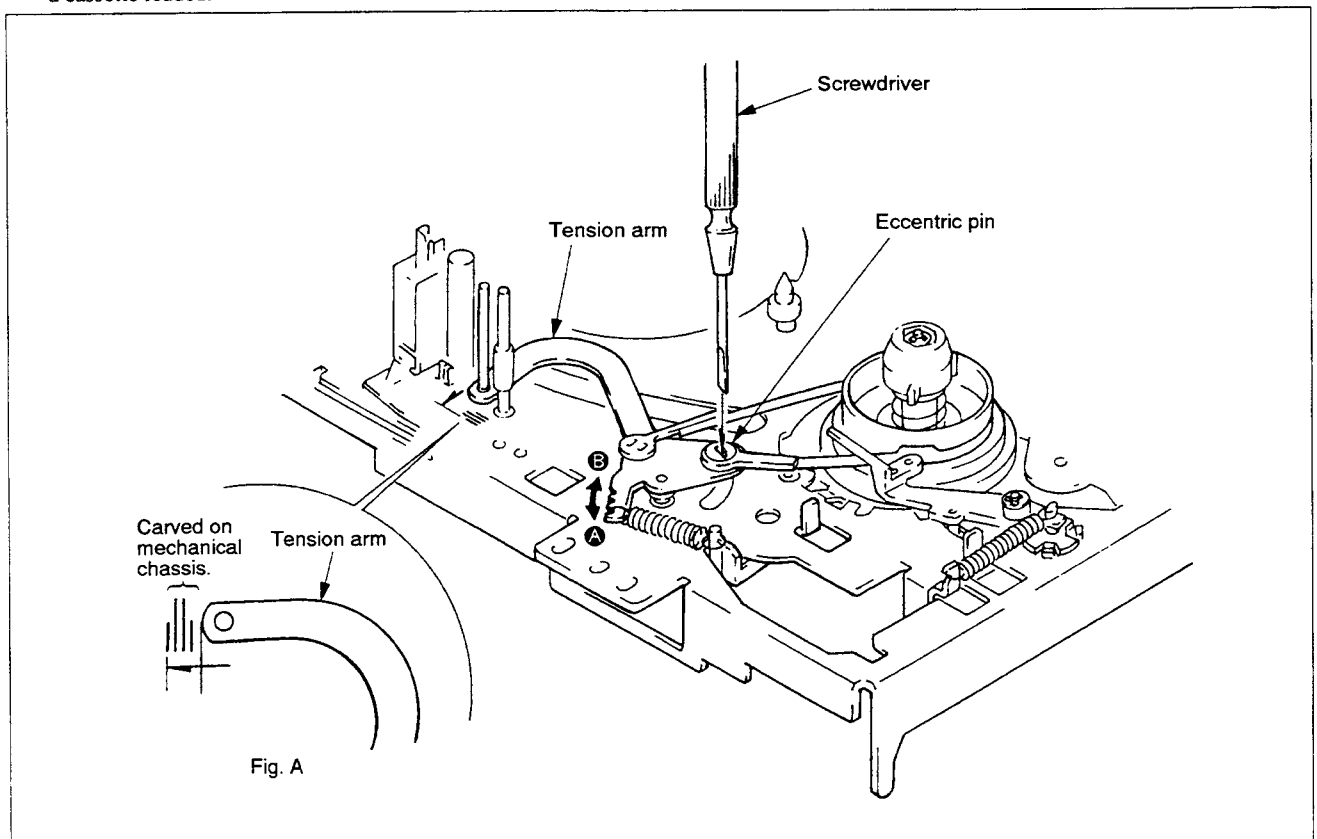


Fig. 4-1

#### 4-1-2. TG8 GUIDE ROLLER HEIGHT ADJUSTMENT (Fig. 4-2)

|                      |                                      |
|----------------------|--------------------------------------|
| Mode                 | Playback                             |
| Jig                  | Blank tape                           |
| Adjustment locations | Guide roller height adjustment screw |
| Specified value      | 0 to 0.1 mm                          |

##### Procedure:

- 1) Set the tape, during CUE playing back, check the height from lower flange of TG7 to the running tape. (Fig. A)
- 2) During REV playing back, check the height from lower flange of TG7 to the running tape. (Fig. B)
- 3) When the difference between items 1) and 2) doesn't go to specified value, adjust by turning TG8 guide roller height adjustment screw.
- 4) Check the tape is creased or not between the capstan and TG8, adjust with TG8 guide roller height adjustment screw so that the tape is not creased during normal playback, CUE and REV.

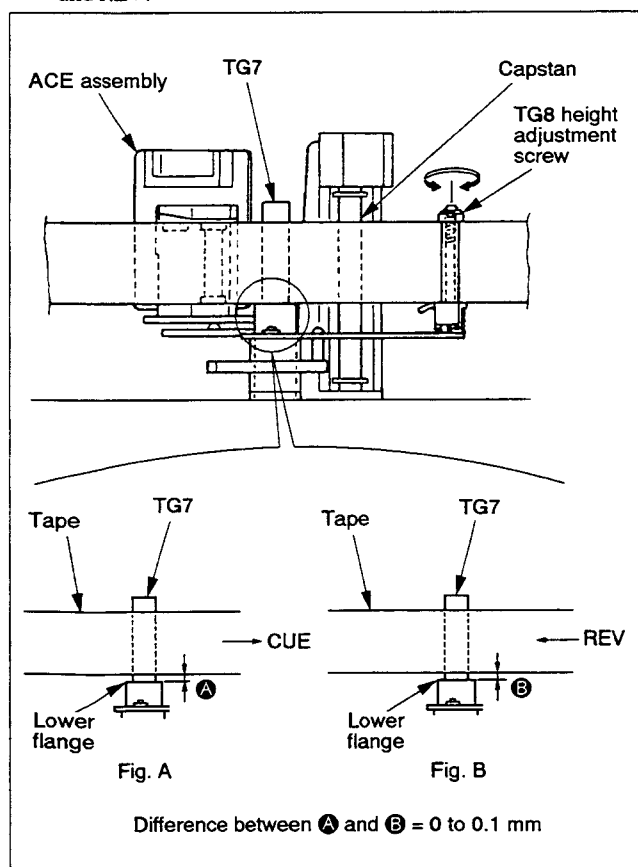


Fig. 4-2

#### 4-1-3. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6 (Fig. 4-3)

|                      |                                                                                                        |
|----------------------|--------------------------------------------------------------------------------------------------------|
| Mode                 | Playback                                                                                               |
| Signal               | Alignment tape                                                                                         |
| Measuring instrument | Oscilloscope                                                                                           |
| Measuring point      | CH-1: Connector PB RF pin for RF PC board check.<br>CH-2: Connector RF SW P pin for RF PC board check. |
| Adjustment locations | Guide roller height adjuster screw                                                                     |

##### [Adjustment Method]

- 1) Tracking (playback): Turn off the auto tracking, then press the tracking buttons and simultaneously to set the tracking at the center position.  
(If adjustment is made after the drum is replaced, the tracking must be set at the max. RF output position.)
- 2) Height adjuster screw: Even out the RF output waveforms.
- 3) Press the tracking buttons (playback), and alternately.
- 4) Check that RF output drops the same amount at the front and rear edges.

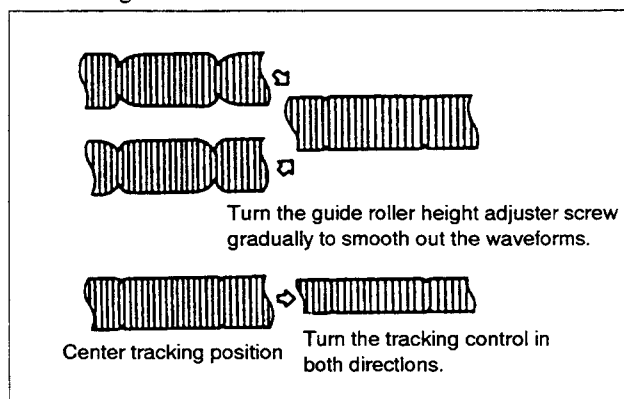


Fig. 4-3

#### 4-1-4. ACE HEAD ASSEMBLY ADJUSTMENT (ROUGH ADJUSTMENT) (Figs. 4-4 and 4-5)

**Purpose:** Allows the tape to make even contact with the head for recording and playback of the specified track.

|                      |                                          |
|----------------------|------------------------------------------|
| Mode                 | Playback                                 |
| Tool                 | Blank tape                               |
| Adjustment locations | Height adjuster nut, Tilt adjuster screw |

##### [Adjustment Method]

- 1) Mount the ACE head assembly. At this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
- 2) Remove the adjustment tool and load a new tape, then set the unit for playback.
- 3) Check that the tape does not curl or rise up noticeably near the ACE head.
- 4) If the tape curls up or rises noticeably, readjust the tilt adjuster screw, the azimuth adjuster screw and the height adjuster nut.  
(The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)

- 5) Perform precision adjustment.

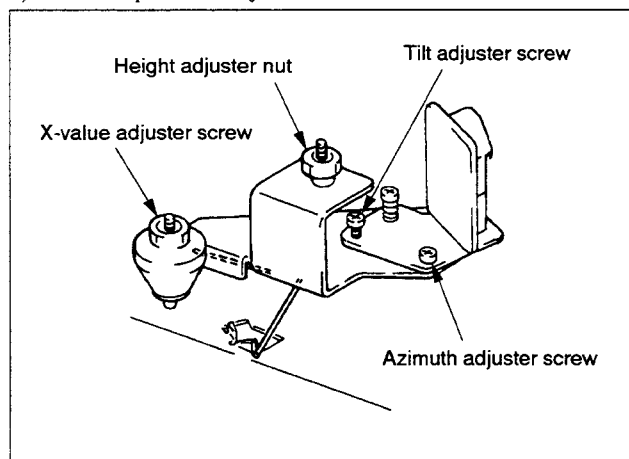


Fig. 4-4

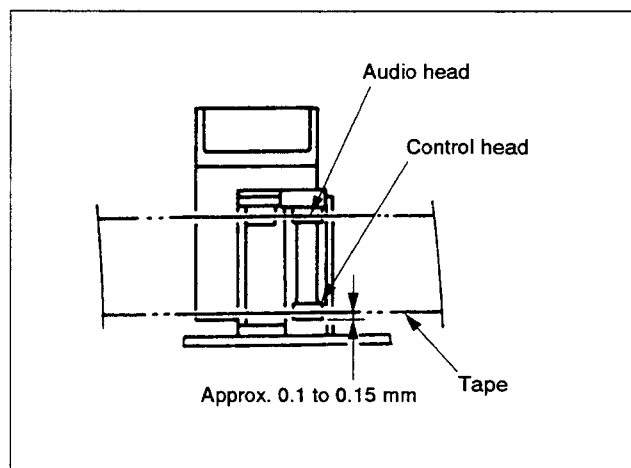


Fig. 4-5

#### 4-1-5. ACE HEAD ASSEMBLY ADJUSTMENT (PRECISION ADJUSTMENT)

|                      |                                                                     |
|----------------------|---------------------------------------------------------------------|
| Mode                 | Playback                                                            |
| Signal               | Alignment tape (1kHz track)                                         |
| Measuring instrument | Oscilloscope                                                        |
| Measuring point      | Audio output terminal                                               |
| Adjustment locations | Azimuth adjuster screw,<br>Height adjuster nut, Tilt adjuster screw |

##### [Adjustment Method]

- 1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or rise.
- 2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.

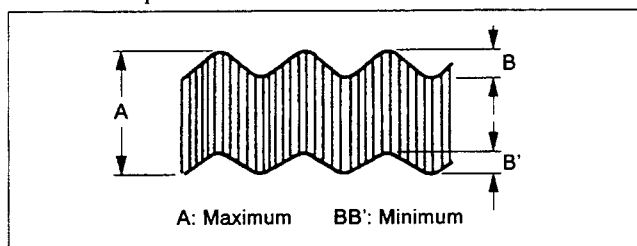


Fig. 4-6

#### 4-1-6. X-VALUE ADJUSTMENT

**Purpose:** To obtain compatibility with other VTR

**Precaution:** Be sure to perform the preset tracking adjustment before perform this adjustment. (Refer to the Service Guide.)

Turn off the auto tracking and set the VTR for manual tracking mode.

|                      |                                                                                                        |
|----------------------|--------------------------------------------------------------------------------------------------------|
| Mode                 | Playback                                                                                               |
| Signal               | Alignment tape                                                                                         |
| Measuring instrument | Oscilloscope                                                                                           |
| Measuring point      | CH-1: Connector PB RF pin for RF PC board check.<br>CH-2: Connector RF SW P pin for RF PC board check. |
| Adjustment locations | X-value adjuster screw                                                                                 |

##### [Adjustment Method]

##### • Adjustment by Hi-Fi alignment tape (NTSC only)

When the tracking is set at the center position (by pressing the  and  keys simultaneously), adjust the RF output to maximum.

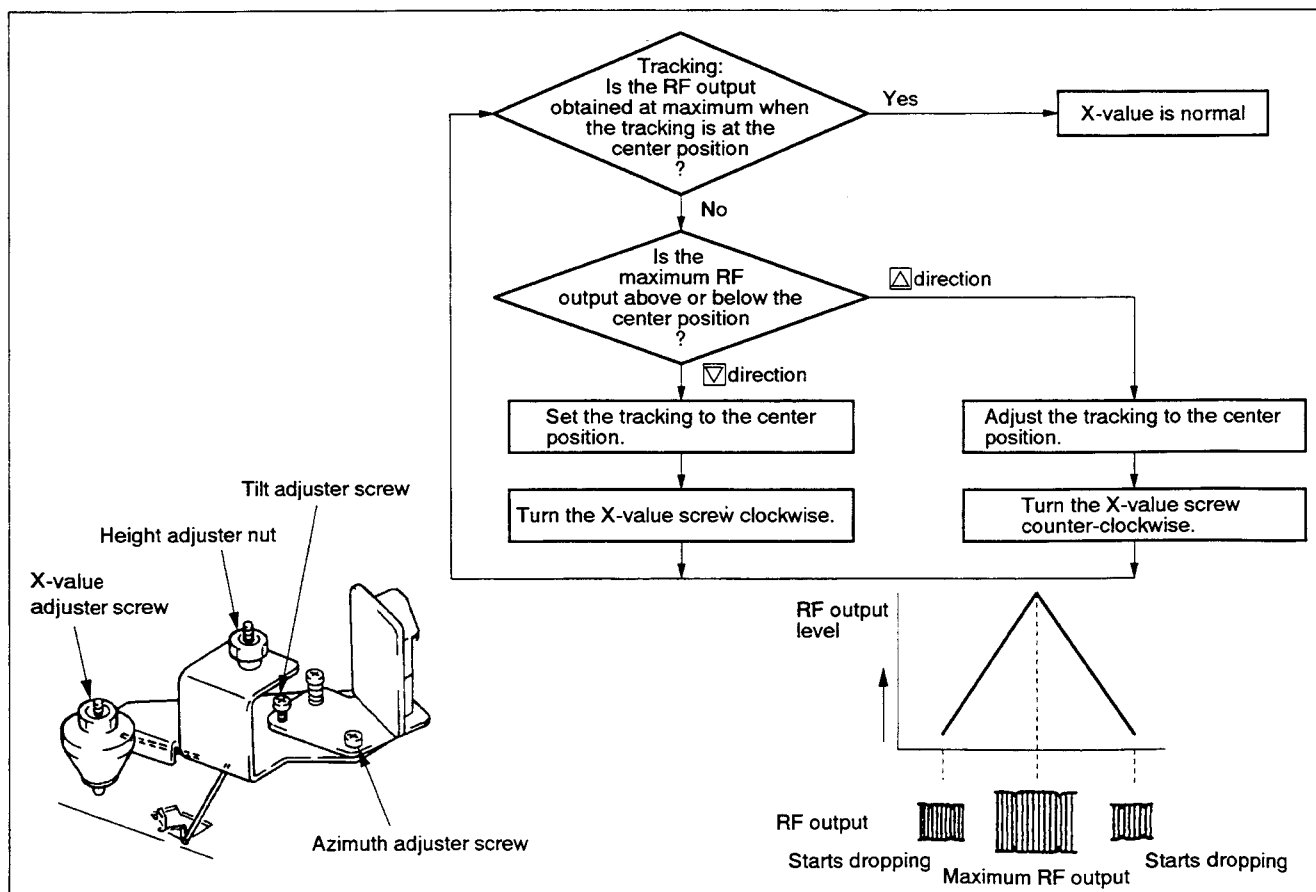


Fig. 4-7

- **Adjustment by alignment tape**

Adjust the X-value adjuster screw so that maximum RF output is obtained and also that the RF output drops to the same position on pressing the respective ▽ and ▴ buttons while the tracking is set at the center position.

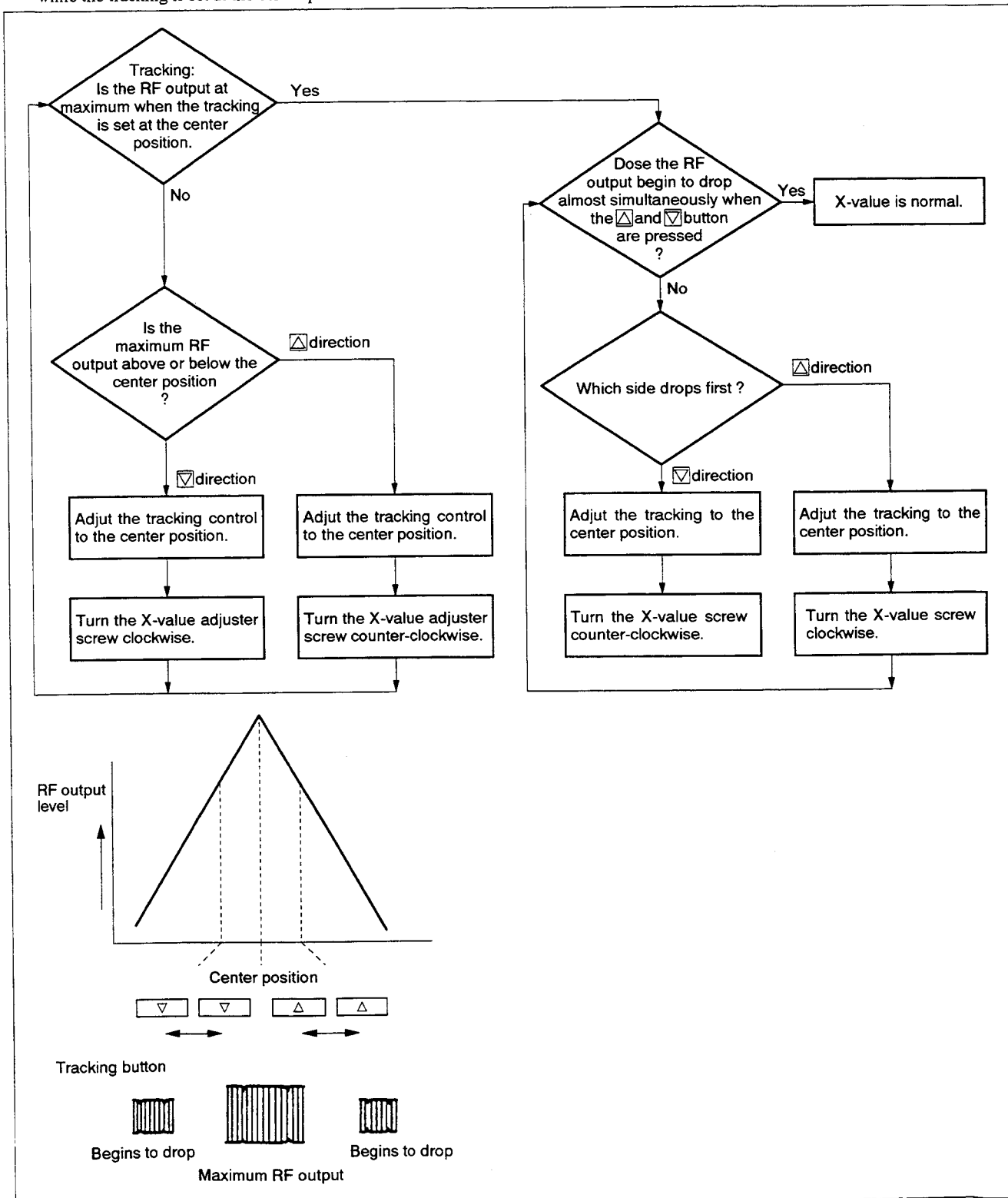


Fig. 4-8

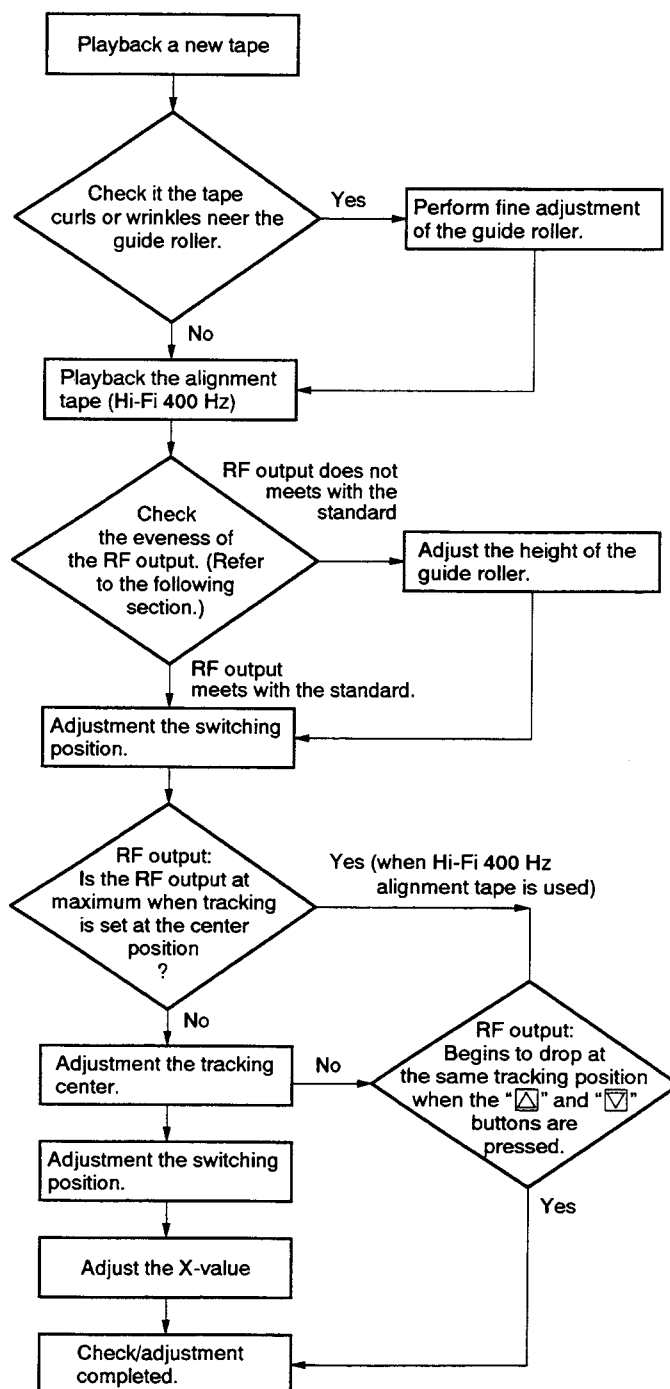
#### 4-1-7. ADJUSTMENTS AFTER REPLACING THE DRUM (VIDEO HEAD)

**Purpose:** Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

**Precaution:** Turn off the auto tracking and set the manual tracking mode.

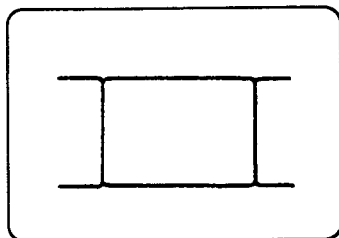
|                      |                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mode                 | Playback                                                                                                                                                    |
| Signal               | Alignment tape, blank tape                                                                                                                                  |
| Measuring instrument | Oscilloscope                                                                                                                                                |
| Measuring point      | CH-1: Connector PB RF pin for RF PC board check.<br>CH-2: Connector RF SW P pin for RF PC board check.                                                      |
| Adjustment locations | Guide roller (refer to 4-1-2, 4-1-3.)<br>Switching position, Tracking preset, SP delay mono-multi (Refer to the Service Manual), X-value. (refer to 4-1-6.) |

#### [Adjustment Method]

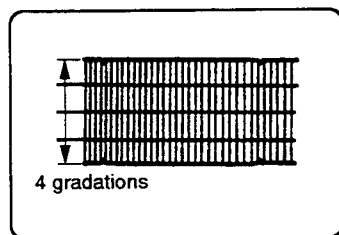


**[Checking the evenness and fluctuation of the RF output]**

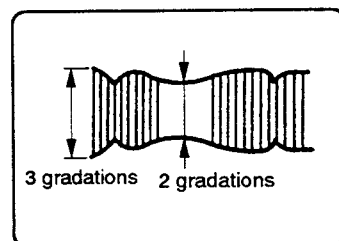
- 1) Set the RF output to the maximum level using the tracking buttons.



- 2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



- 3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
- 4) At this time, check if the minimum amplitude is more than 2 gradations.



- 5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

#### 4-1-8. CHECKING THE TENSION AND TORQUE

**Purpose:** To check that the tension, torque and compression force of the tape take-up section and mobile sections to ensure smooth tape run and achieve standard VTR performance.

If the tape transport is not smooth or problems occur in relation to the tape transport speed, perform the following check.

|                      |                                                                              |
|----------------------|------------------------------------------------------------------------------|
| Mode                 | Each operation mode without loading a cassette tape. (Refer to section 1-3.) |
| Measuring instrument | Torque gauge, Torque gauge adaptor                                           |

| Item                | VTR operation mode | Reel to be measured      | Measurement value                            |
|---------------------|--------------------|--------------------------|----------------------------------------------|
| Main brake torque   | Stop               | Supply and take-up reels | 170 g•cm or more                             |
| Review torque       | Review             | Supply reel              | 180 ± 30 g•cm<br>(using the torque cassette) |
| Take-up torque      | Playback           | Take-up reel             | 95 ± 25 g•cm<br>(using the torque cassette)  |
| Back tension torque | Playback           | Take-up reel             | 33 to 44 g•cm<br>(using the torque cassette) |

#### [Check Method]

Measure the torque using the torque gauge and torque gauge adaptor with the torque gauge fixed.

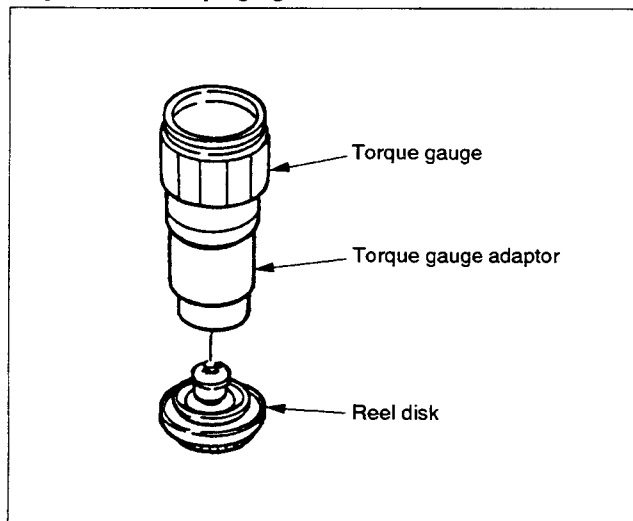


Fig. 4-9

V03056

# VHS MECHANICAL ADJUSTMENT MANUAL IV

## SONY<sup>®</sup> SERVICE MANUAL

H MECHANISM

### SUPPLEMENT-1

1. How to Use the Mode Selector II for Adjusting H Type Mechanism Assembly.
2. Adjusting Mechanism Using New Alignment Tape (KRV-52NE For NTSC).

File this supplement with the VHS mechanical adjustment IV.

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## 1. HOW TO USE THE MODE SELECTOR II FOR ADJUSTING H TYPE MECHANISM ASSEMBLY

### 1-1. OUTLINE

To activate the VHS system H type mechanism assembly using mode selector II (J-6082-282-A), use connector conversion jig (J-6090-052-A). By using the connector conversion jig, the following operations are possible.

- Loading and unloading action by the loading motor
- Reading of the current setting of the mode switch
- Normal and reverse rotation of the capstan motor

### 1-2. PREPARATION

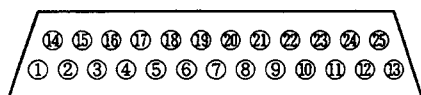
#### 1-2-1. ADDITION OF POWER SUPPLY CABLE

(Already added Mode Selector II also available)

In order to drive the capstan motor, the power +5 V and +12 V are supplied from the Mode Selector II. Disassemble the D-SUB connector of the Mode Selector cable, then solder the following three places.

| Supplied 3-pin cable | DSUB connector of the mode selector II | Voltage |
|----------------------|----------------------------------------|---------|
| Pin 1 (Red index)    | Pin 20                                 | +12 V   |
| Pin 2                | Pin 25                                 | GND     |
| Pin 3                | Pin 24                                 | +5 V    |

- Connector pin number assignment of the DSUB connector (From the soldering side)



- When connections are made, check that +5 V and +12 V are available at the 3-pin cable connector.

#### 1-2-2. CHECKING THE SOFTWARE VERSION

Turn on the power of the mode selector II.

If the reading for the software version on the mode selector II is not 1.10 or higher, replace the New ROM (J-6082-314-A).

### 1-3. CONNECTION

#### 1-3-1. CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE MODE SELECTOR II (See Fig. 1-1)

Insert the connectors of the two 6-pin cables (one is white and the other is black) and the 3-pin cable from the mode selector II to the corresponding connectors on the connector conversion jig (J-6090-052-A).

#### 1-3-2. CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE H TYPE MECHANISM ASSEMBLY

With the power of the mode selector II turned off, insert the following three connectors to the corresponding connectors on the H type mechanism assembly.

- 3-pin connector for the loading motor
- 5-pin connector for the mode switch
- 8-pin connector for the capstan motor

Set the speed control for the minimum setting (fully counterclockwise).

### 1-4. OPERATION

#### 1-4-1. OPERATION OF THE LOADING MOTOR ON THE H TYPE MECHANISM ASSEMBLY

- (1) Select the H type mechanism assembly setting on the mode selector II.
- (2) After this, procedures are the same as those for the previous model types.

For the operating method, see pages 3 to 5 of "8 mm Video Mechanism Manual VI (TK Mechanism) Supplement-1".

For the loading method, see page 3 of "VHS Mechanical Adjustment Manual IV (H Mechanism)".

#### 1-4-2. OPERATION OF THE CAPSTAN MOTOR ON THE H TYPE MECHANISM ASSEMBLY

- (1) For the loading motor operation under Section 1-4-1, change the mode setting to the FF/REW mode with the mode switch.
- (2) Turn the speed control gradually in clockwise direction, and the capstan motor starts rotating. To turn the capstan motor in desired rotating direction, change the FWD/RVS setting of the rotating direction switch.

### 1-5. PRECAUTIONS

- Turn the speed control only when necessary. Otherwise, hold the speed control turned at fully counterclockwise direction. If the power of the mode selector II is turned on with the speed control turned in clockwise direction, +12V power fails and the power of the mode selector II cannot be turned on.
- Although the connector conversion jig (J-6090-052-A) has rubber feet, do not make a short circuit on the bottom surface of the connector conversion jig via foreign conductive materials.

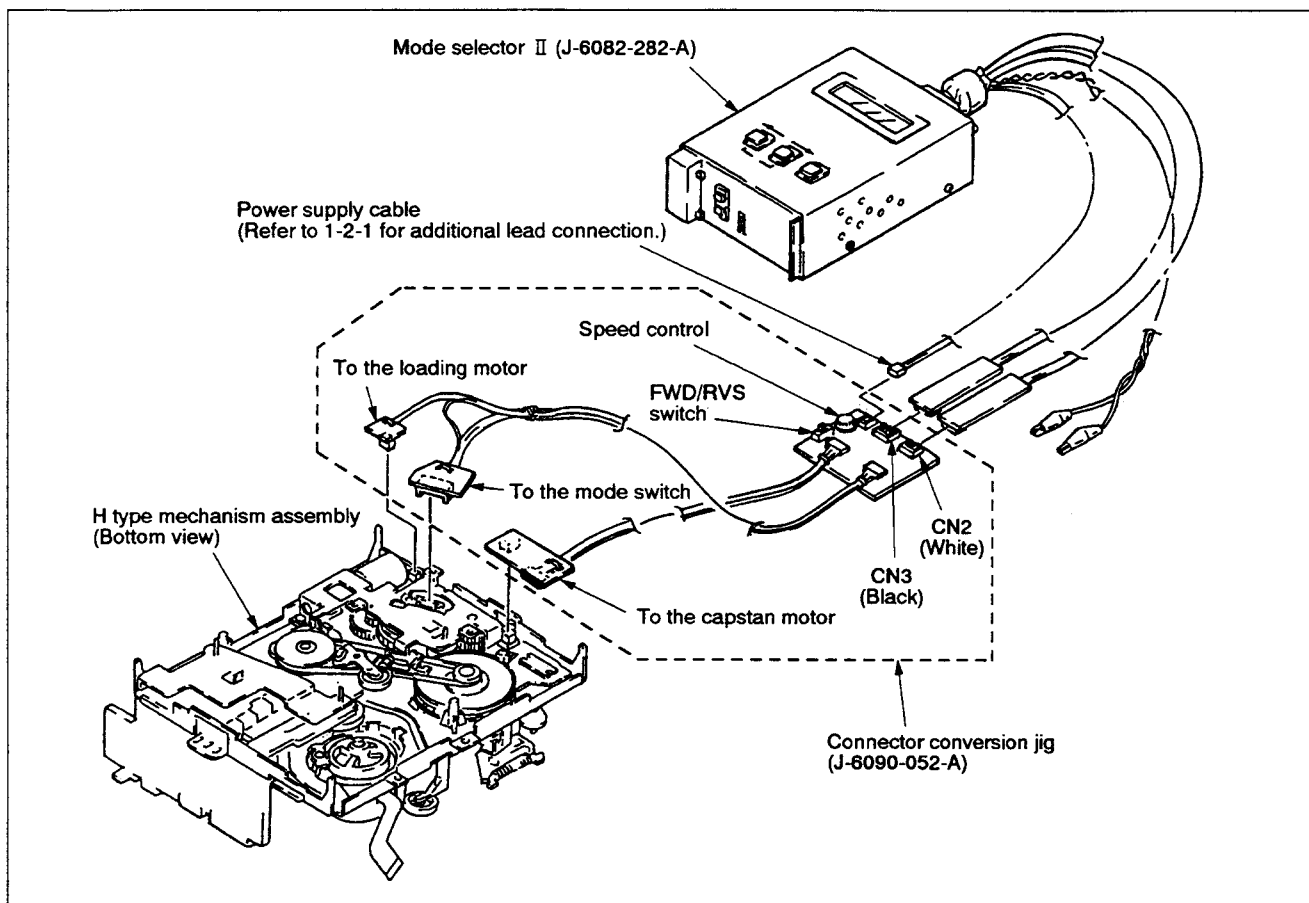


Fig. 1-1

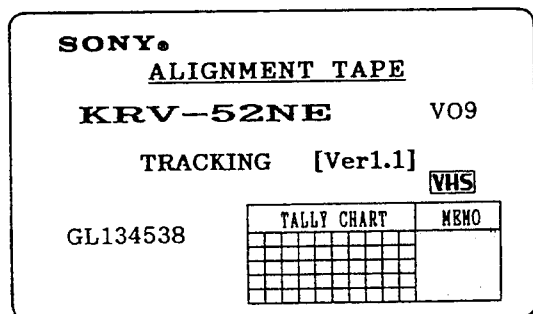
## 2. ADJUSTING THE MECHANISM USING NEW ALIGNMENT TAPE (KRV-52NE for NTSC)

The conventional alignment tape (For NTSC) is now replaced with alignment tape KRV-52NE, and the following describes how to align the mechanism using the KRV-52NE. For details on the use of KRV-51N2 for each model, refer to the service manuals which will be issued in the future.

| Name                                | Parts No.    | Remarks                                                                         |
|-------------------------------------|--------------|---------------------------------------------------------------------------------|
| Alignment tape<br>KRV-52NE for NTSC | 8-192-605-41 | For tape path, audio azimuth, and X-value adjustments                           |
| Alignment tape<br>KRV-51N2 for NTSC | 8-192-605-32 | For electrical adjustments (RF, AF, and switching position) and operation check |

**Note:** The KRV-52NE has or does not have Ver No. depending on new or old type as shown below. (New one has Ver No.)

Note that an adjusting method of X-value is different.



### Contents:

KRV-52NE (NTSC)

| Time    | Video                                                                      | Audio                |
|---------|----------------------------------------------------------------------------|----------------------|
| 20 min. | Recording only at 1 MHz, A-ch.<br>EP mode<br>RF skipping once per 5 frames | 5 kHz<br>full tracks |

KRV-51N2 (NTSC)

| Class | Mode | Time   | Video       | Audio<br>(HiFi/Normal) |
|-------|------|--------|-------------|------------------------|
| 1     | SP   | 7 min. | Color bar   | 400 Hz                 |
| 2     | SP   | 3 min. | Mono. scope | 400 Hz                 |
| 3     | EP   | 7 min. | Color bar   | 400 Hz                 |
| 4     | EP   | 3 min. | Mono. scope | 400 Hz                 |

### 2-1. ADJUSTMENT USING ALIGNMENT TAPE (KRV-52NE for NTSC having no version No.)

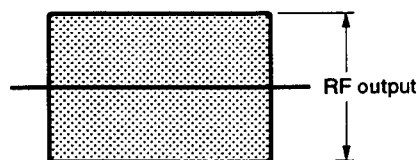
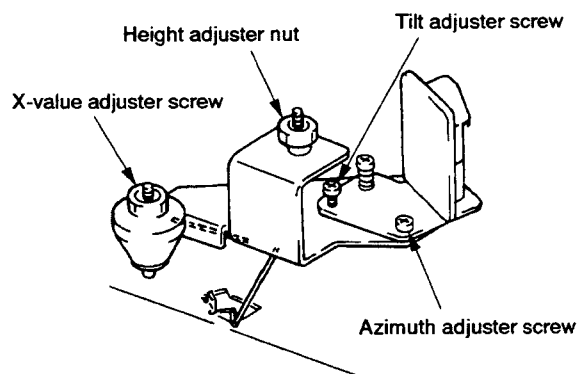
#### 2-1-1. X-VALUE ADJUSTMENT (Using the tape having no version No.)

**Purpose:** To obtain compatibility with other VCRs.

**Precaution:** Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control

control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking **AUTO/MANUAL** key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

| Mode                 | Playback                                                                                            |
|----------------------|-----------------------------------------------------------------------------------------------------|
| Signal               | Alignment tape KRV-52NE<br>(For NTSC having no version No.)                                         |
| Measuring instrument | Oscilloscope<br>TIM/DIV: 2ms<br>Trigger source: CH2<br>Trigger slope: +                             |
| Measuring point      | CH-1: Connector PB RF pin for RF PC board check<br>CH-2: Connector RF SWP pin for RF PC board check |
| Adjustment locations | X-value adjuster screw                                                                              |

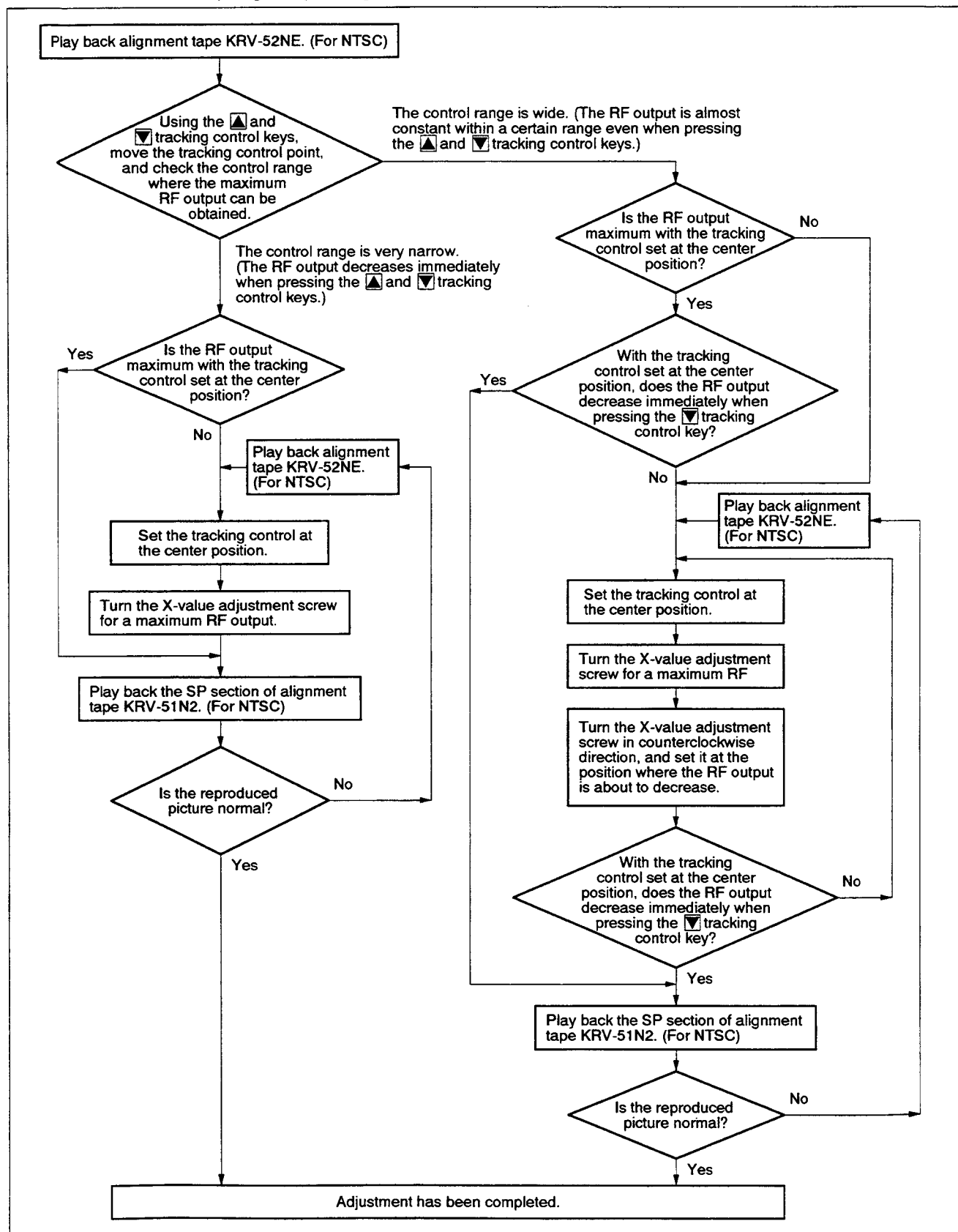


RF output shall be maximum at the center position of the tracking control.

#### [Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with narrow gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

# X-VALUE ADJUSTMENT (Using the tape having no version No.)



When adjustment is complete, adjust the height of No. 3 and No. 6 guide rollers on page 10.

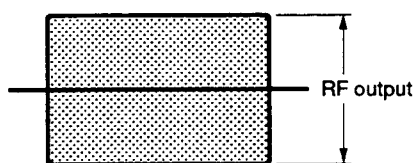
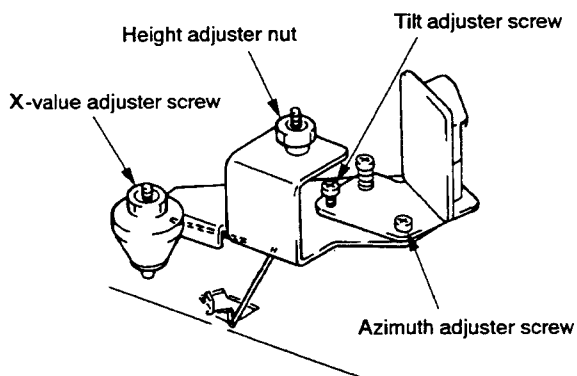
## 2-2. ADJUSTMENT USING ALIGNMENT TAPE (KRV-52NE for NTSC having the version No.)

### 2-2-1. X-VALUE ADJUSTMENT (Using the tape having the version No.)

**Purpose:** To obtain compatibility with other VCRs.

**Precaution:** Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

|                      |                                                                                                     |
|----------------------|-----------------------------------------------------------------------------------------------------|
| Mode                 | Playback                                                                                            |
| Signal               | Alignment tape KRV-52NE<br>(For NTSC having the version No.)                                        |
| Measuring instrument | Oscilloscope<br>TIM/DIV: 2ms<br>Trigger source: CH2<br>Trigger slope: +                             |
| Measuring point      | CH-1: Connector PB RF pin for RF PC board check<br>CH-2: Connector RF SWP pin for RF PC board check |
| Adjustment locations | X-value adjuster screw                                                                              |

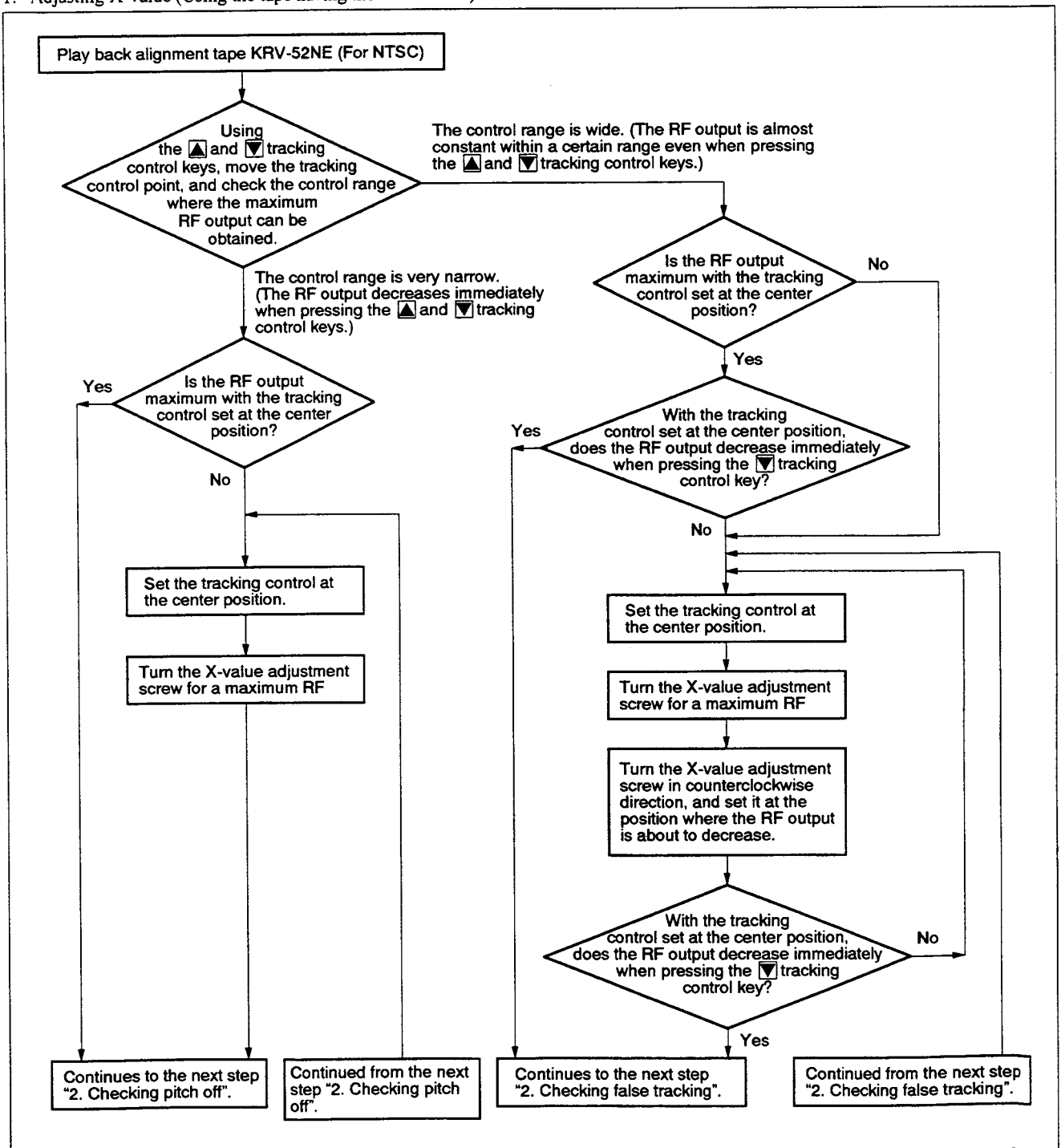


RF output shall be maximum at the center position of the tracking control.

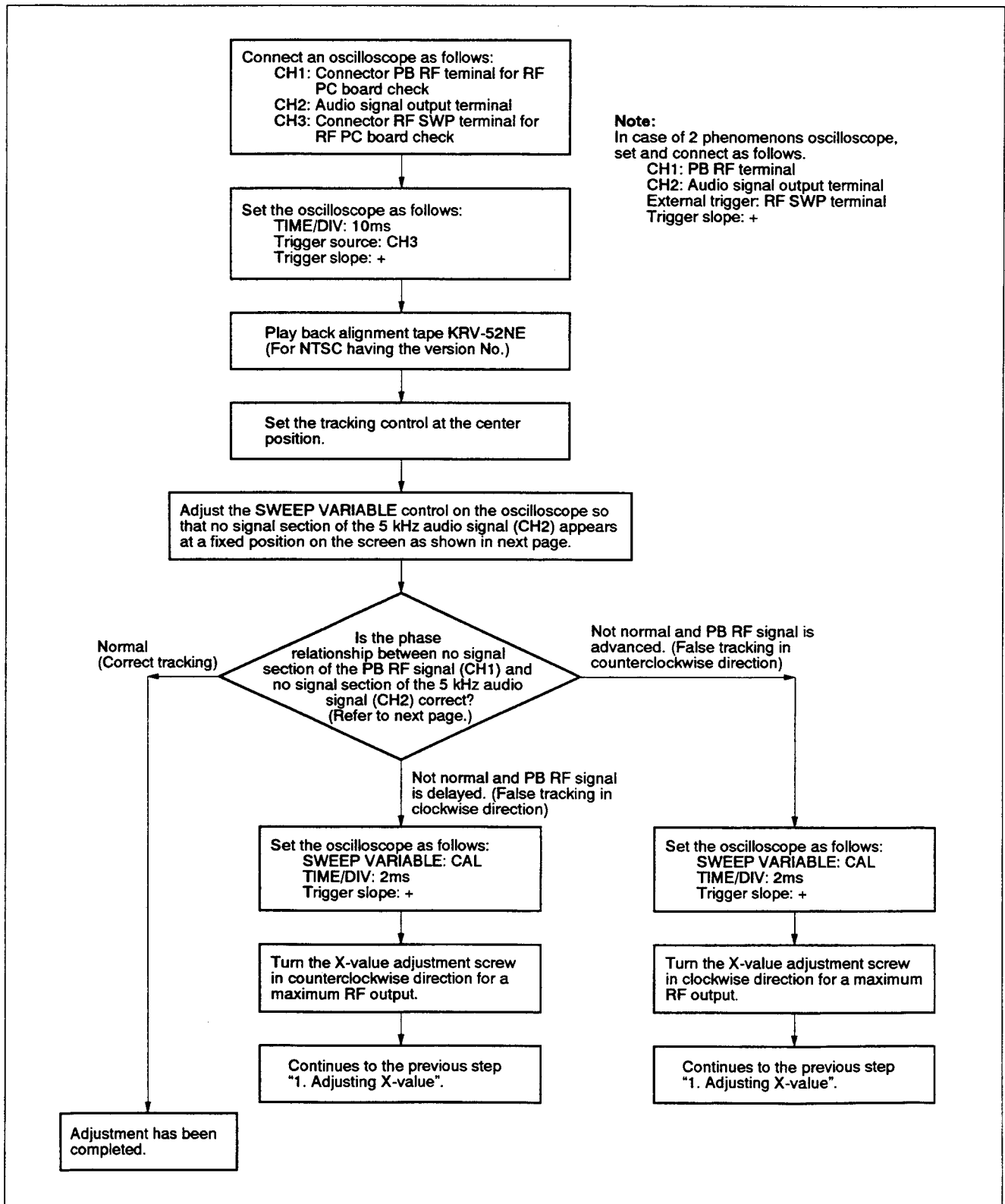
### [Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with narrow gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

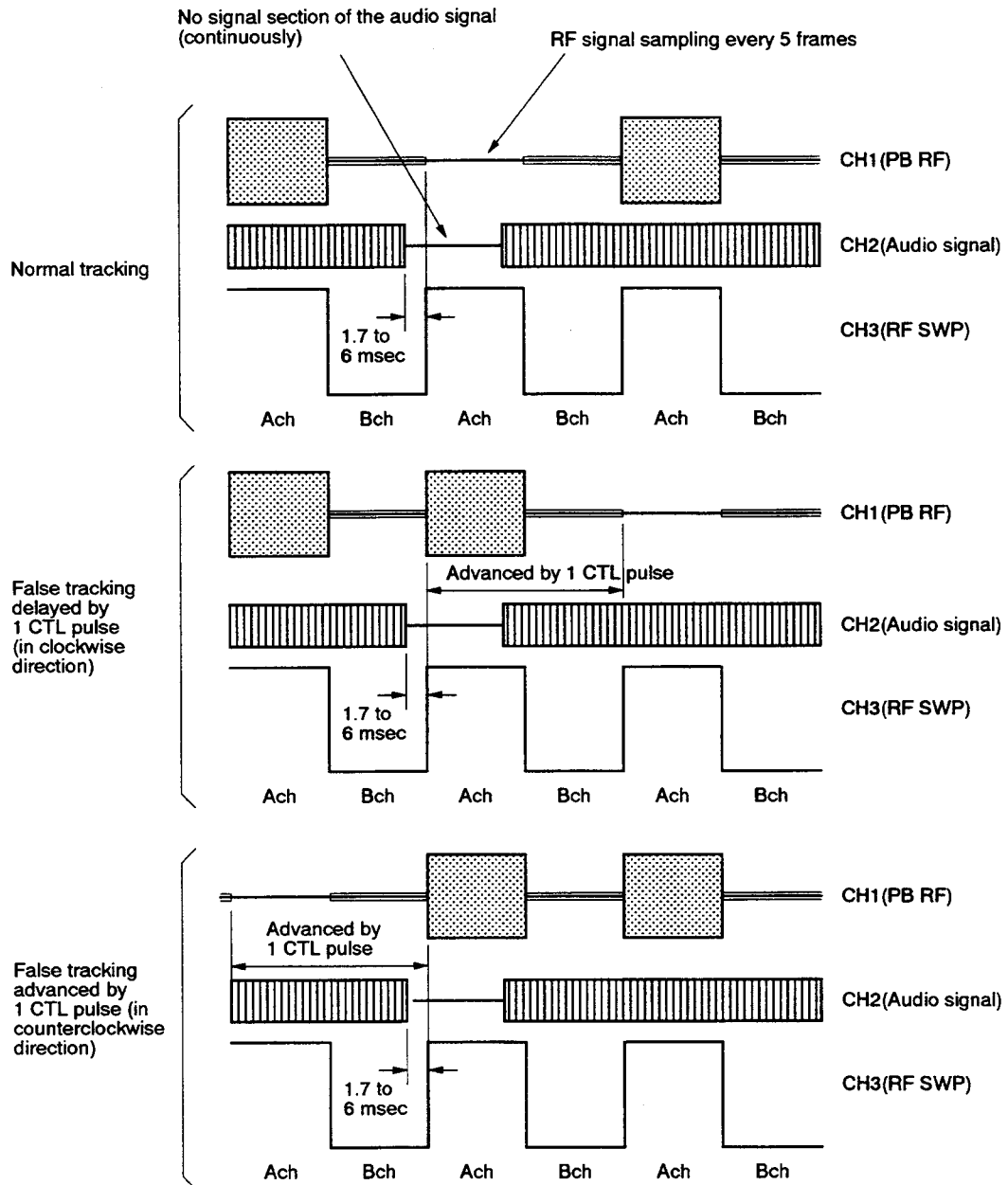
#### 1. Adjusting X-value (Using the tape having the version No.)



2. Checking false tracking (Using the tape having the version No.)



**Using the tape having the version No.**



## 2-3. ADJUSTING THE MECHANISM USING ALIGNMENT TAPE (KRV-52NE for NTSC)

### 2-3-1. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6

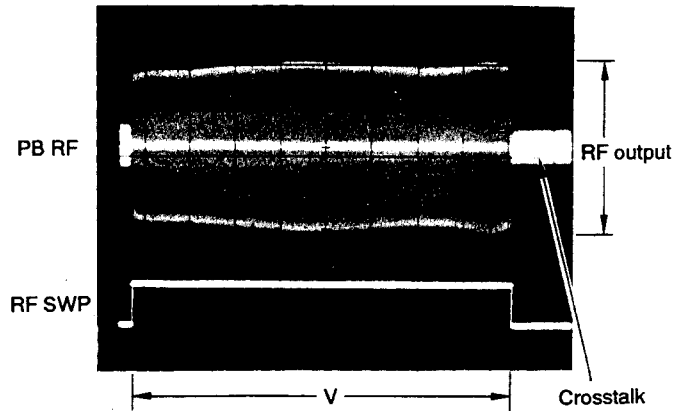
|                      |                                                                                                          |
|----------------------|----------------------------------------------------------------------------------------------------------|
| Mode                 | Playback                                                                                                 |
| Signal               | Alignment tape KRV-52NE (For NTSC)                                                                       |
| Measuring instrument | Oscilloscope<br>TIM/DIV: 2ms<br>Trigger source: CH2<br>Trigger slope: +                                  |
| Measuring point      | CH-1: Connector PB RF pin for RF PC board check<br>CH-2: Connector RF SWP pin for RF PC board check      |
| Adjustment locations | Height adjustment screw for No.3 tape guide roller<br>Height adjustment screw for No.6 tape guide roller |

#### [Adjustment Method]

The following adjustment shall be carried out after completed Section 2-1-1 "X-value adjustment and check".

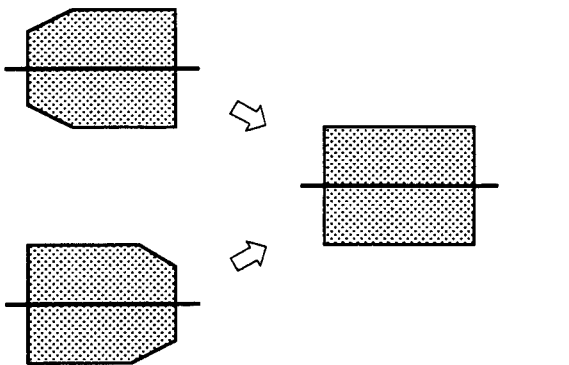
- 1) Deactivate the automatic tracking control, and set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the and tracking control keys, press both the and tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking **AUTO/MANUAL** key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

- 2) Check if the RF output changes in amplitude by pressing the tracking control key. The RF output should change periodically (changes from a minimum amplitude to a maximum amplitude, and to the minimum amplitude again).



- 3) Turn the height adjustment screws of tape guide rollers No.3 and No.6 so that the RF output envelope becomes as flat as possible.
- 4) Press the tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.
- 5) Press the tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

Turn the height adjustment screws of tape guide rollers No.3 and No.6 little by little so that the RF output envelope becomes as flat as possible.

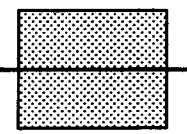


Press the tracking control key, then the tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

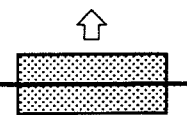
When the tracking control key is pressed.



At the tracking center position.



When the tracking control key is pressed.



### 2-3-2. ACE HEAD ASSEMBLY ADJUSTMENT (ROUGH ADJUSTMENT) (Figs. 2-1 and 2-2)

**Purpose:** Allows the tape to make even contact with the head for recording and playback of the specified track.

| Mode                 | Playback                                 |
|----------------------|------------------------------------------|
| Jig                  | Blank tape                               |
| Adjustment locations | Height adjuster nut, Tilt adjuster screw |

#### [Adjustment Method]

- 1) Mount the ACE head assembly. At this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
- 2) Remove the adjustment tool and load a new tape, then set the unit for playback.
- 3) Check that the tape does not curl or rise up noticeably near the ACE head.
- 4) If the tape curls up or rises noticeably, readjust the tilt adjuster screw and the height adjuster nut.  
(The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)
- 5) Perform precision adjustment.

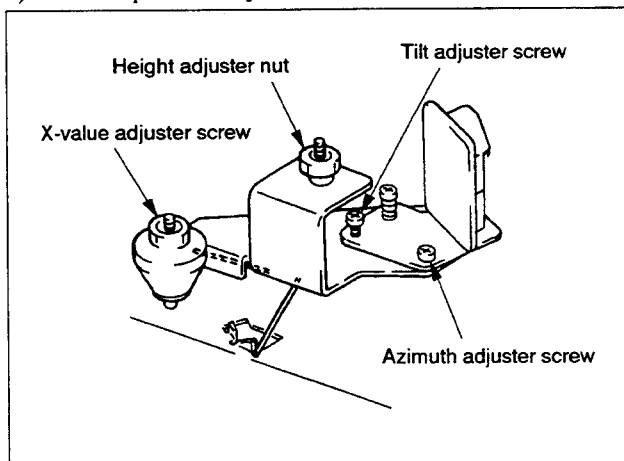


Fig. 2-1

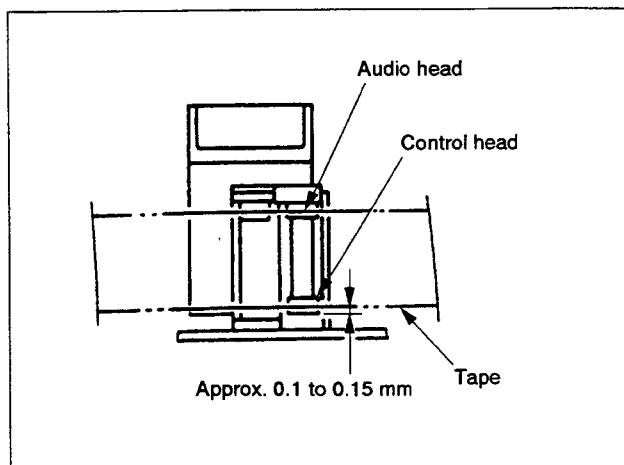


Fig. 2-2

### 2-3-3. ACE HEAD ASSEMBLY ADJUSTMENT (PRECISION ADJUSTMENT)

| Mode                 | Playback                                                            |
|----------------------|---------------------------------------------------------------------|
| Signal               | Alignment tape (KRV-52NE 5 kHz)<br>(For NTSC)                       |
| Measuring instrument | Oscilloscope                                                        |
| Measuring point      | Audio output terminal                                               |
| Adjustment locations | Azimuth adjuster screw,<br>Height adjuster nut, Tilt adjuster screw |

#### [Adjustment Method]

- 1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or rise.
- 2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.

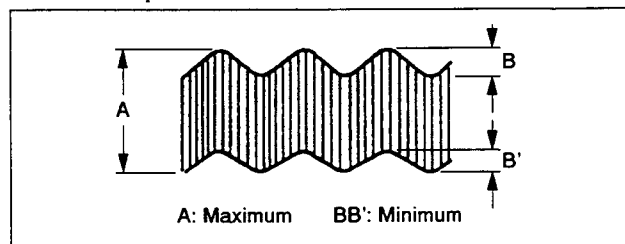


Fig. 2-3

## 2-3-4. ADJUSTMENTS AFTER REPLACING THE DRUM (VIDEO HEAD)

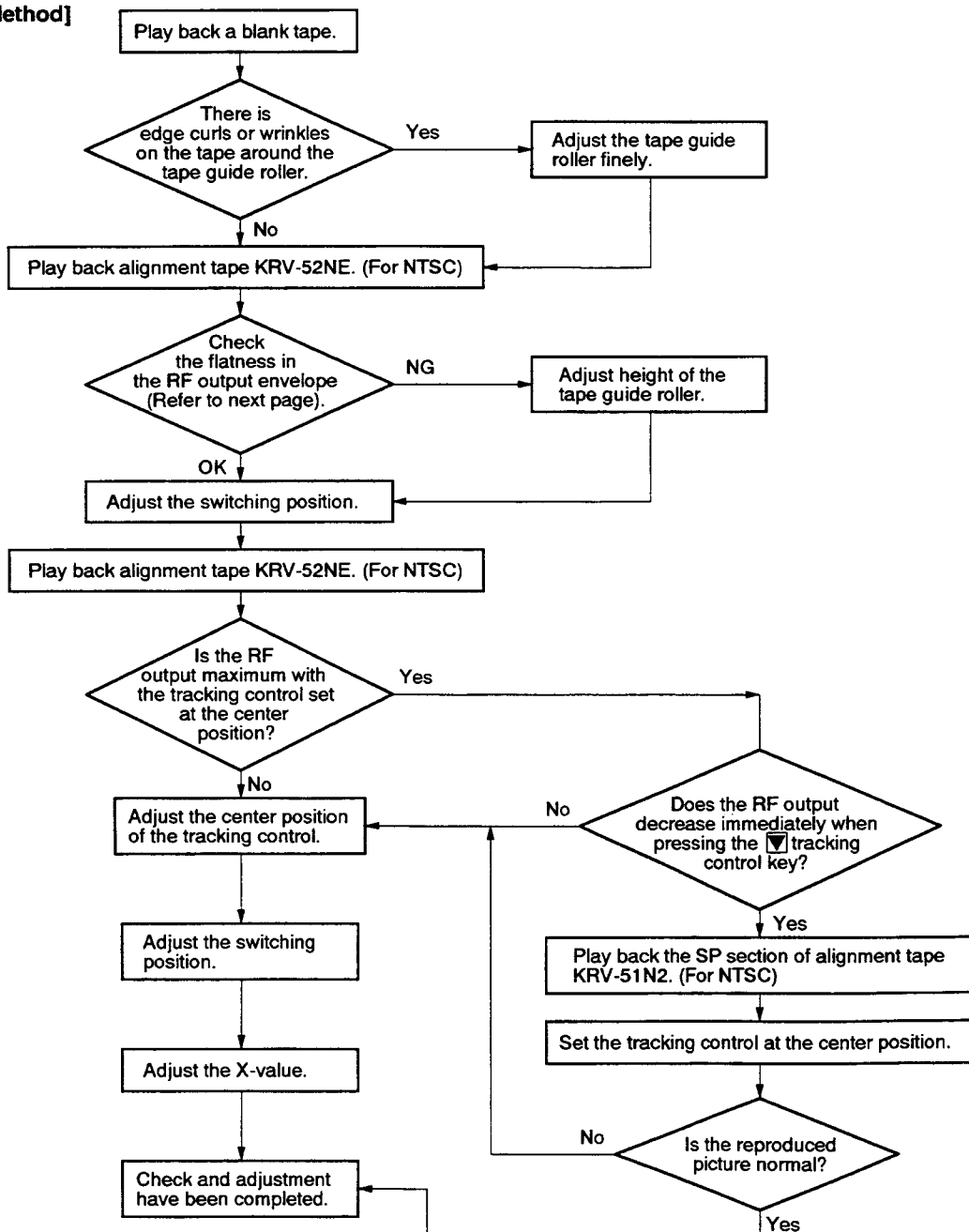
**Purpose:** Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

**Note 1:** Deactivate the automatic tracking control for setting the mechanism in manual tracking control mode.

**Note 2:** To set the tracking control at the center position, deactivate the automatic tracking control by pressing the tracking **AUTO/MANUAL** key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

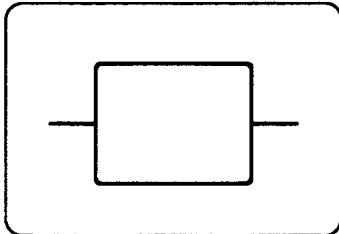
| Mode                 | Playback                                                                                                                  |
|----------------------|---------------------------------------------------------------------------------------------------------------------------|
| Signal               | Alignment tape KRV-52NE<br>(For NTSC), blank tape                                                                         |
| Measuring instrument | Oscilloscope                                                                                                              |
| Measuring point      | CH-1: Connector PB RF pin for RF PC<br>board check.<br>CH-2: Connector RF SWP pin for RF<br>PC board check.               |
| Adjustment locations | Guide roller (Refer to 2-3-1.)<br>Switching position (Refer to the<br>Service Manual)<br>X-value (Refer to 2-1-1, 2-1-2.) |

### [Adjustment Method]

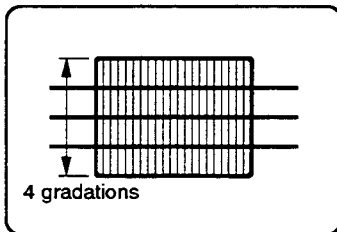


**[Checking the evenness and fluctuation of the RF output]**

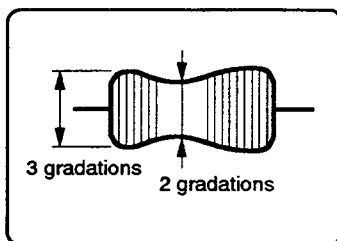
- 1) Set the RF output to the maximum level using the tracking buttons.



- 2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



- 3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
- 4) At this time, check if the minimum amplitude is more than 2 gradations.



- 5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

# VHS MECHANICAL ADJUSTMENT MANUAL IV

9-973-623-82

**Sony Corporation**  
Consumer A&V Products Company  
Home A&V Products Div.

English  
95D05112-1  
Printed in Japan  
© 1995. 4  
Published by Personal A&V Products Div.  
Quality Engineering Dept.

# VHS MECHANICAL ADJUSTMENT MANUAL IV

## SONY<sup>®</sup> SERVICE MANUAL

H MECHANISM

### SUPPLEMENT-2

File this supplement with the VHS mechanical adjustment IV and supplement-1.

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#### 1. CORRECTION

In the VHS Mechanism Adjustment Manual IV (Supplement-1), an adjustment sequence was wrong, and it is corrected as follow;

##### 1-1. Adjustment Sequence (VHS Mechanism Adjustment Manual IV (Supplement-1) Page 6 to 11)

- (1) Adjustment of No. 3 and No. 6 guide roller height

Delete the "The following adjustment shall be carried out after completed Section 2-1-1 "X-value adjustment and check" under "Adjustment Method" on page 10.

- (2) Adjustment of ACE head assembly

**Note:** In the adjustment of ACE head assembly (coarse adjustment and fine adjustment), if a azimuth, height and tilt were adjusted, again adjust the height of No. 3 and No. 6 guide rollers.

- (3) Adjustment of X value



## 2. MODIFICATION

### 2-1. CHANGING THE RECORDED CONTENTS OF ALIGNMENT TAPE

KRV-52NE (NTSC) (Ver. 1.2)

| Time    | Video                                                                      | Audio                        |
|---------|----------------------------------------------------------------------------|------------------------------|
| 20 min. | Recording only at 1 MHz, A-ch.<br>EP mode<br>RF skipping once per 5 frames | 5 kHz → 4 kHz<br>full tracks |

### 2-2. TG2 ROLLER, FE HEAD ASSEMBLY (Refer to VHS Mechanical Adjustment Manual IV page14)

- The TG2 roller is provided with either of two types, fixed or straight. For the fixed type, section 3-5 is added.

### 3-5. TG2 ROLLER, FE HEAD ASSEMBLY (Fig. 3-5)

- 1) Remove screw ① to pull out FE head assembly ②.

#### [Note on Mounting]

- Keep clean the surface contacts tape of TG2 roller.

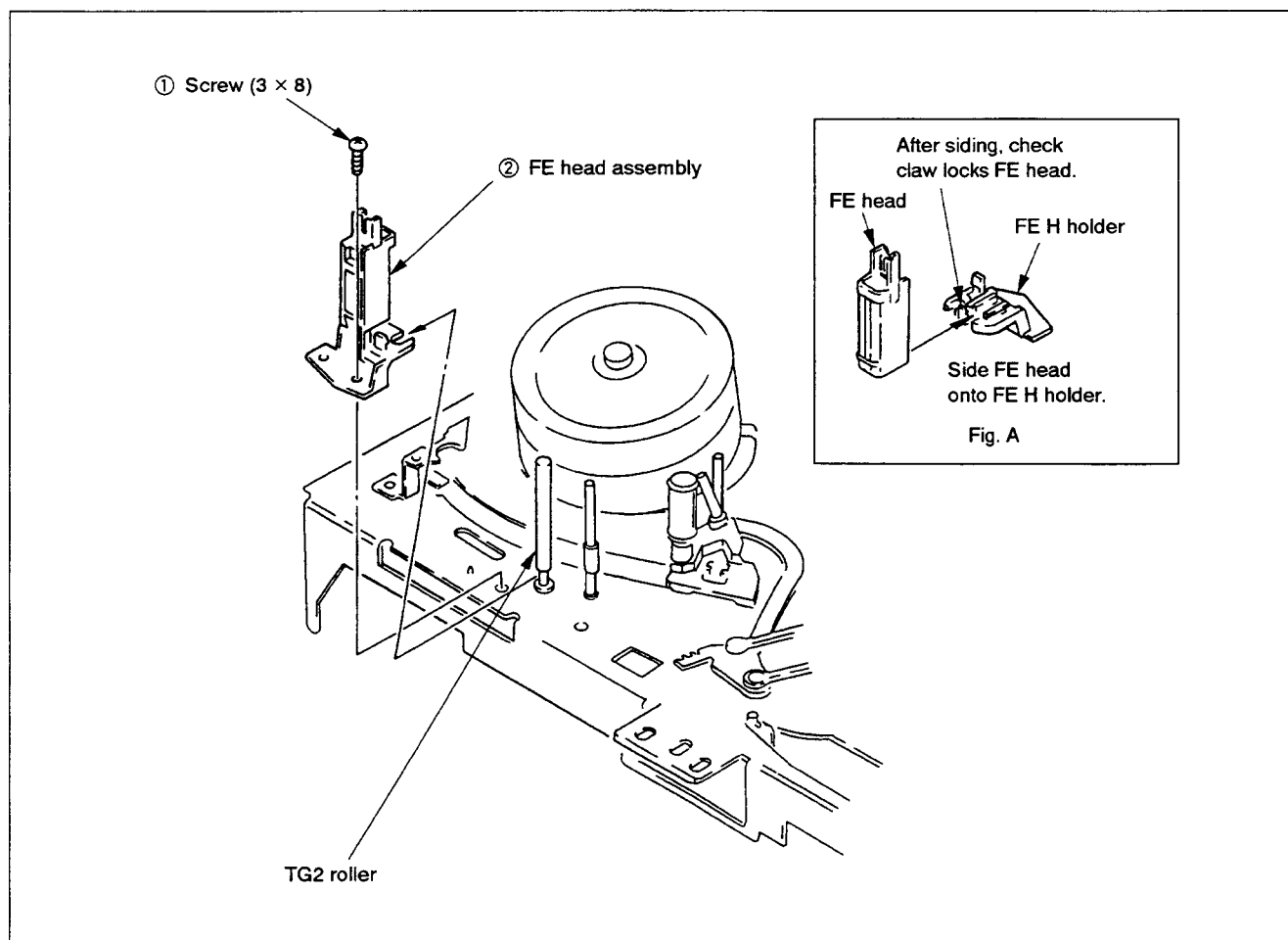


Fig. 3-5

### 2-3. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Refer to VHS Mechanical Adjustment Manual IV page 17)

- There is another type in TG3 and TG6 guide roller assemblies, which is not attached with a screw (B2X3). For the screwless type, section 3-8 is added.

### 3-8. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Fig. 3-8)

- 1) TG3 guide roller assembly ① by turning it in arrow A direction.
- 2) Removal the spring ②.
- 3) TG6 guide roller assembly ③ by turning it in arrow B direction.
- 4) Removal the spring ④.

#### [Note on Mounting]

- Keep clean the surface contacts tape of TG3 and TG6 guide roller assemblies ①, ③.

#### [Adjustment after Mounting]

- 4-1. Tape path adjustment.

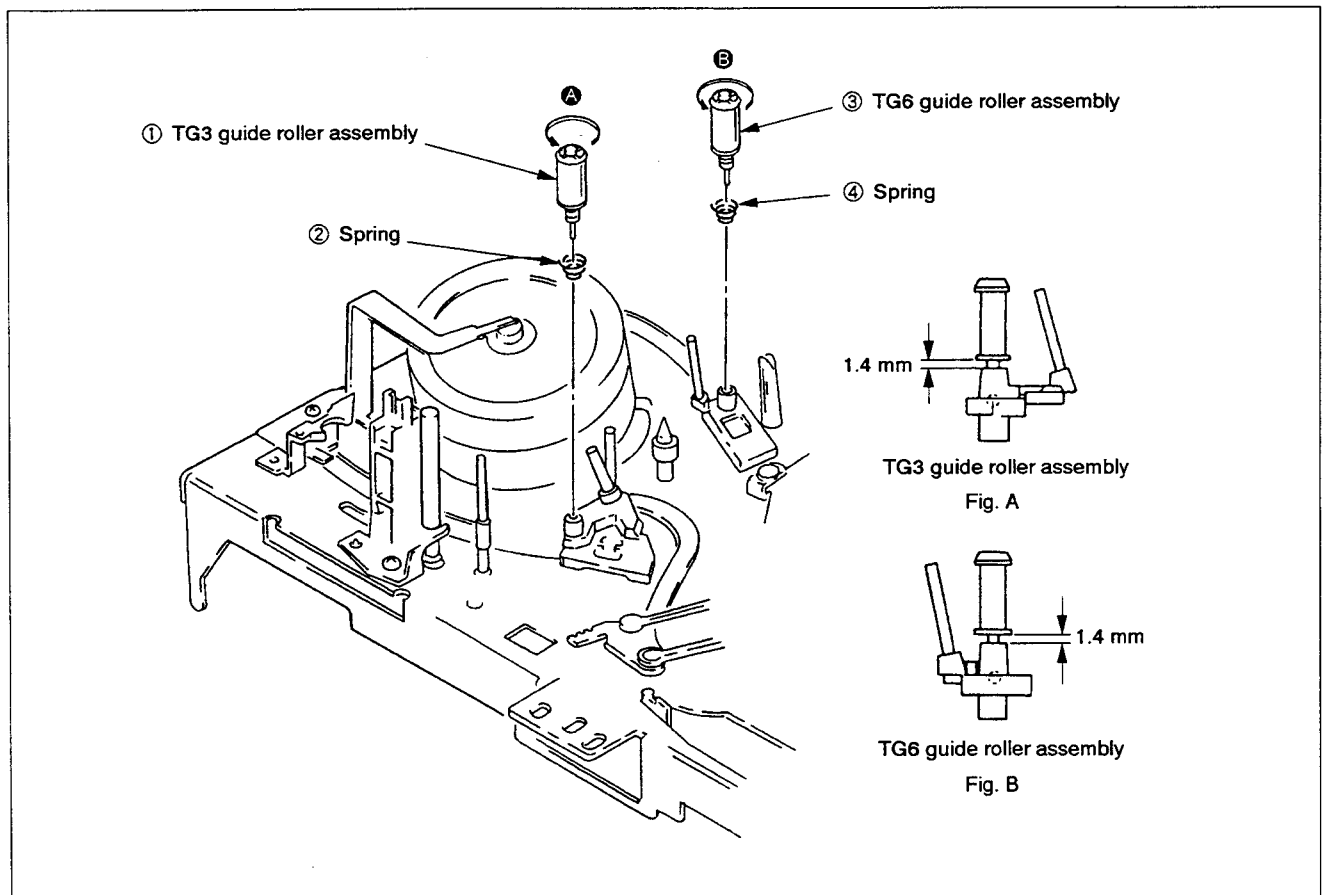


Fig. 3-8

## 2-4. TG8 ASSEMBLY (Refer to VHS Mechanical Adjustment Manual IV page 23)

- As the shape of TG8 assembly was changed, Section 3-13 is changed.

 : Changed portion

### 3-13. TG8 ASSEMBLY (Fig. 3-15)

- 1) Remove TG7 tape retainer ① to pull out TG8 assembly ②.

#### [Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portion.
- Keep clean the surface contacts tape of TG8 assembly ②.
- Be careful not to change the shape of TG7 tape retainer ①.
- After attaching the TG7 tape retainer ①, check that side A of ① is below side B of the stepped-part of the TG7 shaft. (Fig. A)

#### [Adjustment after Mounting]

- 4-1. Tape path adjustment.

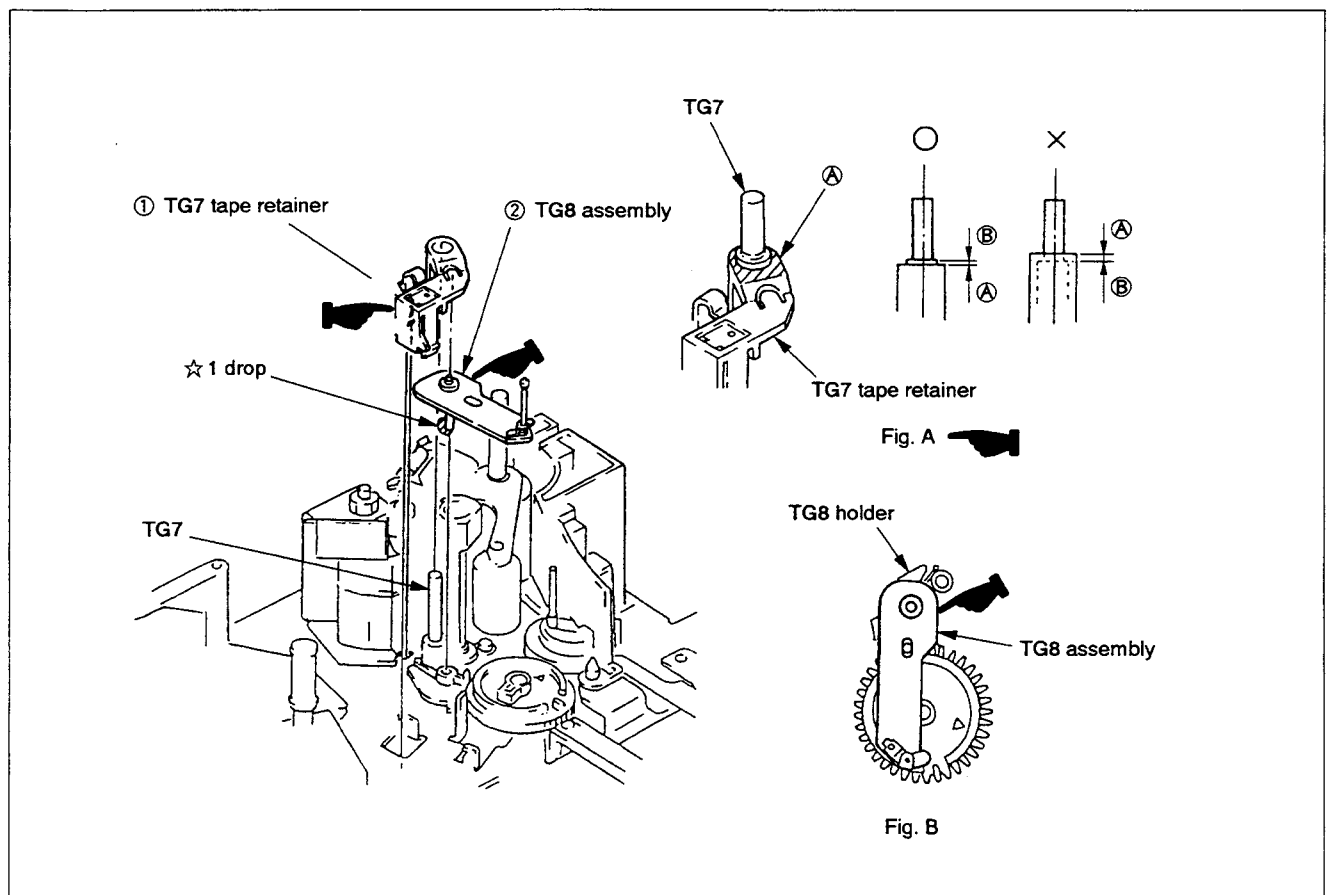


Fig. 3-15

**2-5. TENSION REGULATOR (TG1) POSITION/  
TENSION ADJUSTMENT**  
(Refer to VHS Mechanical Adjustment  
Manual IV page 35)

- As the tension regulator position and tension adjustment were changed, the tension adjustment and Fig. 4-1 are changed.

 : Changed portion

• Tension adjustment

|                           |                                         |
|---------------------------|-----------------------------------------|
| Mode                      | Playback                                |
| Measuring instrument/tool | Torque cassette                         |
| Adjustment locations      | Position for hooking the tension spring |
| Specified value           | 34 ± 4 g*cm                             |

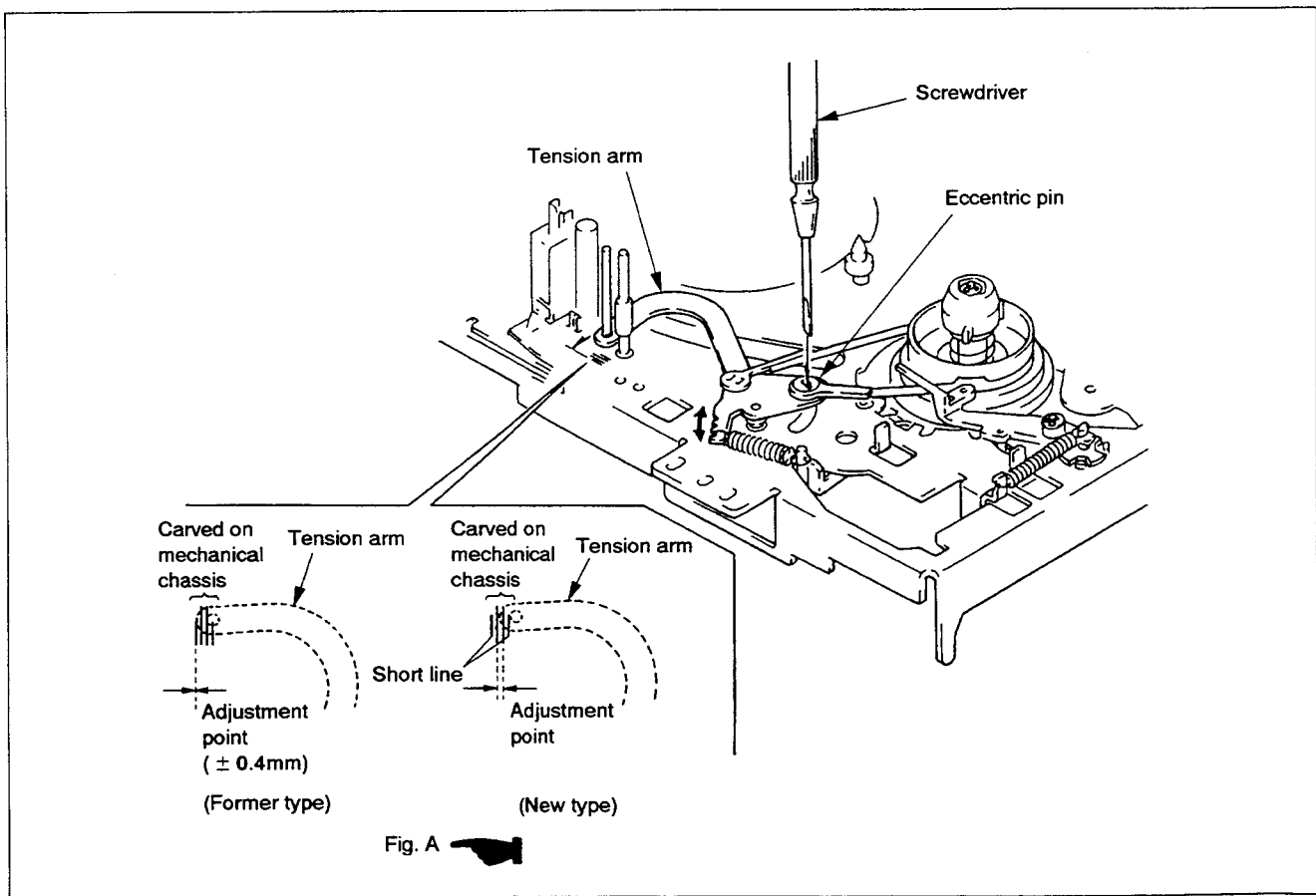


Fig. 4-1

# VHS MECHANICAL ADJUSTMENT MANUAL IV

## 2-6. TG8 GUIDE ROLLER HEIGHT ADJUSTMENT (Refer to VHS Mechanical Adjustment Manual IV page 36)

- As the use of TG8 height adjusting screw was cancelled, section 4-1-2 is changed.

### 4-1-2. TG7 TAPE PATH ADJUSTMENT (Fig. 4-2)

#### [Adjustment Method]

- 1) Load a tape, and playback the tape in the CUE mode, confirm the distance between lower flange of No. 7 guide roller and lower side of tape (Fig. A).
- 2) Then, feeding the tape in the REV mode, confirm the distance between lower flange of No. 7 guide roller and lower side of tape.
- 3) If the tape height in the REV feed is higher than that in the CUE playback (Fig. B), rotate the ACE head flapping adjust screw in the direction **A** so that a difference in tape height between CUE mode and REV mode becomes zero.
- 4) If the tape height in the REV feed is lower than that in the CUE playback (Fig. C), rotate the ACE head flapping adjust screw in the direction **B** so that a difference in tape height between CUE mode and REV mode becomes zero.

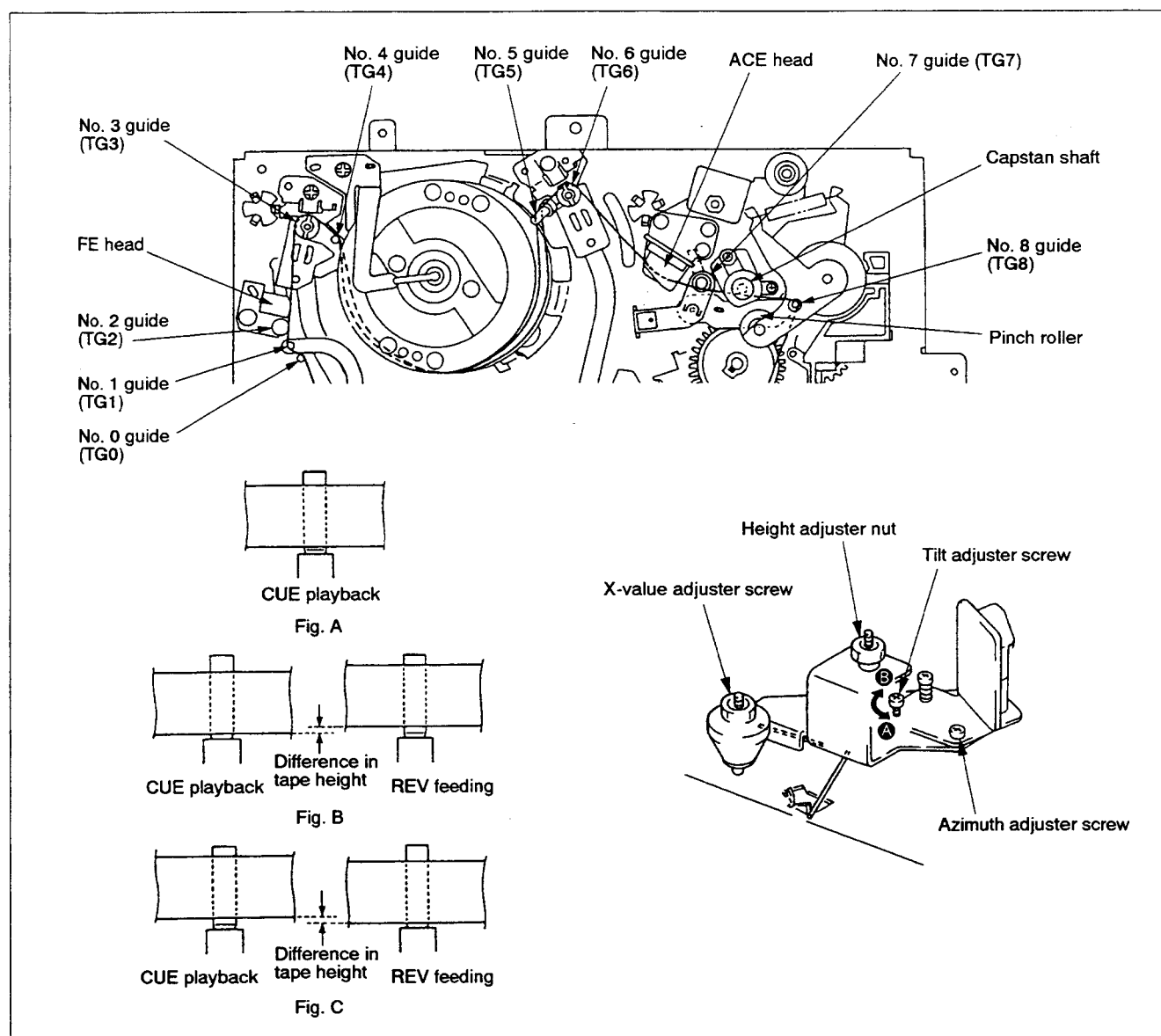


Fig. 4-2

**Sony Corporation**  
Consumer A&V Products Company  
Home A&V Products Div.

English  
95H05103-1  
Printed in Japan  
© 1995. 8

Published by Personal A&V Products Div.  
Quality Engineering Dept.